

THE IDENTIFICATION
OF TREES & SHRUBS

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HOW TO NAME WITHOUT PREVIOUS KNOWLEDGE OF
BOTANY ANY WILD OR GARDEN TREE OR SHRUB
LIKELY TO BE MET WITH IN THE BRITISH ISLES
WITH 2,500 DIAGRAMS MADE BY THE AUTHOR

BY

F. K. MAKINS, F.L.S.

Diploma of Forestry of the University of Oxford, Formerly
Exhibitioner in Natural Science at Trinity College, Cambridge,
Deputy Conservator of Forests in the Government of India
and Instructor in Botany in the Forest College, Dehra Dun



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INTRODUCTION

It is not the purpose of this book to compete with the many excellent works on the selection and cultivation of trees and shrubs, but to provide the amateur without previous knowledge of the subject with the means of identifying any tree or shrub he is likely to meet with, growing in the open in any part of the British Isles. The explorations of Wilson, Henry, and others, have resulted in such a large addition to our shrub flora in recent years that even the experienced professional gardener is often at a loss when confronted with many of the newer kinds. As, however, there can be few parts of the world left unexplored by collectors, it is probable that the limit has now been reached in the case of hardy trees and shrubs; and the time has arrived to place before the public a tree and shrub flora of these islands in a readily accessible and inexpensive form, and with some prospect of completeness.

The most popular method of identification is by means of illustrations. In this book will be found illustrations of 1,311 species, belonging to 534 genera. As the total number of genera described here is 552 it will be seen that nearly every genus of tree or shrub native to the British Isles or cultivated in our gardens has been figured. To illustrate every species, amounting to 1,732 in all, would have made the book too bulky and expensive. It should not, however, be difficult to name any species, first, by comparing it with the illustrations of others in the same genus, and then by referring to the descriptions given in the later part of the book.

As this book could not have been produced without special facilities for examining private collections of exotic trees and shrubs, it remains for the author to express his thanks to all those owners who have so kindly placed their collections at his disposal, and particularly to the Rt. Hon. Henry Hobhouse; to his son, Mr. A. L. Hobhouse (whose head-gardener, Mr. E. W. A. King, has been of the greatest help); to Sir Henry Hoare, Bart.; and to Mr. A. Lewingdon, who is in charge of the Earl of Ilchester's fine collection of sub-tropical plants at Abbotsbury in Dorset.

Valuable help has been freely and generously given at all times by the Directors and Staff of the Botanical Gardens at Kew and Cambridge, especially by Messrs. W. J. Bean and V. S. Summerhayes; by Messrs D. Stewart & Sons, Ltd., Ferndown Nurseries, Wimborne; and by Messrs. John Scott & Co., The Royal Nurseries, Merriott, Somerset.

Apart from local floras the works most frequently consulted have been Rehder's *Manual of Cultivated Trees and Shrubs Hardy in North America* and Bean's *Trees and Shrubs Hardy in the British Isles*. Also the excellent catalogue issued by Messrs. Hillier & Sons, Winchester, has largely influenced the scope of this work.

September 1935.

F. K. M.

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the actual specimen To make sure of the species run through all the descriptions given under one genus This is not so tedious as it sounds, for the largest genera have been split up into groups, each with a different characteristic.

The purpose of the descriptions, therefore, is to supplement the illustrations and to carry the identification as far as the species where that has not already been done With these objects, and also to save space, descriptions have been confined to the salient points of difference between the species

The arrangement of Families is approximately that of Bentham and Hooker, the system in use at Kew

The name of the Family is followed by the floral formula (see page 4) After the floral formula is given a brief list of well-known herbaceous plants, if any, belonging to the Family. (For instance, the flowers of most of the Solanaceae resemble each other, and this fact may assist identification)

The genera belonging to one Family and the species to one genus follow each other in alphabetical order, unless the Family or genus has been subdivided, in which case the alphabetical order is limited to each subdivision

An asterisk (*) indicates that the plant is not hardy at Kew, though successfully grown in the open throughout the year near the south and west coasts of the British Isles.

Generic and specific names are followed in brackets by synonyms still in general use, and then by the common name or names, if any The international rules of botanical nomenclature have been observed wherever they are not likely to lead to serious confusion in the minds of those for whom this book is primarily intended. In order to save space and because of their limited interest, the authorities for the botanical names have not been cited. For these the Kew Hand-list should be referred to.

The first figure after the name of each species shows the maximum height in feet which the plant is expected to reach in these islands, given favourable conditions. Subsequent figures give maximum dimensions in inches. The first figure is followed by the months of flowering, when known.

At the end of each description appears the country of origin. It is interesting to observe that out of the 1,732 species dealt with in this book 29 per cent are natives of China or Japan, 21 of North America, 20 of Europe, 7 of the Himalayas, 6 of New Zealand, 5 of South America, 4 of North and West Asia, 4 per cent are hybrids, 3 per cent are natives of Australia or Tasmania, while only 1 per cent is of African origin.

It is possible that the plant looked for may be one that is unknown to the author or, if known, omitted for lack of space. In either event there can, of course, be no clear identification. In deciding what to omit the question has always been asked: Is it worth growing or likely to be met with? Sometimes there have been other considerations. for instance, a species may owe its inclusion to the part it has played in the production of well-known hybrids, or to its botanical interest, or to the mere chance that the author happens to be more familiar with it than with some other which may have equal claims to notice. Omissions could be made good in a larger edition, should there be enough demand for one.

EXPLANATION OF THE TERMS USED

A. See *Floral Formula* and *Stamens*.

ALTERNATE. Used of leaves or other parts when each one arises from a different level on the stem from the next.

ANTHER The terminal and pollen-bearing part of the stamen, usually yellow. (Fig. 82 c) ✓

APEX. The top. In the case of leaves the end furthest from the point of attachment

AWL-SHAPED. Tapering evenly from base to apex, and not narrowing at the base (Fig. 43 G)

AXIL The upper angle formed by a leaf or branch with the stem, or by a side vein with the main vein.

AXILLARY Used of flowers borne in the axil of a leaf. (Fig. 78 A, H-K, and M)

AXIS An imaginary line running through the centre of a plant or any part of a plant Also used generally of any structure on or immediately around the axis

BASE. The bottom. In the case of leaves that part of the blade nearest the point of attachment. (*Heart-shaped* base, Fig. 78 G; *straight*, Fig. 78 K; *rounded*, Fig. 78 E and L; *tapering* or *wedge-shaped*, Fig. 78 A, D, F-J, and M.)

BRACT Any leaf-like structure on the flower-stalk outside the sepals and petals (Fig. 82 c) Also used of the small leaves from the axils of which the flowers arise. (Fig. 86 G.)

C See *Floral Formula* and *Corolla*

CALYX (K). The outermost parts of the flower, usually green, and resembling a ring of small leaves enclosing the petals and internal organs. (Fig. 82 c.) The separate parts are known as the *sepals*. Denoted in the floral formulae by the letter K (from the Greek word *kalyx*, cover). Note that in the Compositae (Daisy family) there is a false calyx composed of bracts, and that what appears to be one flower is really a composite head of small highly specialized flowers (Fig. 99 L)

CAPSULE. A dry splitting fruit made up of more than one carpel. (Fig. 84 E)

CARPEL. One or more special ovule-bearing structures which will be seen in the centre of most flowers (considered by some botanists to be originally a leaf which has become changed and specialized for the production of seed). After fertilization the carpel usually enlarges and becomes the fruit. (Figs. 112 and 113.)

CATKIN. A tail-like or brush-like collection of small unisexual and usually stalkless flowers without petals, but with scale-like bracts, the whole falling as one, e.g. the 'lambs' tails' of hazel. (Figs 106 to 111.)

CLUSTER. When two or more leaves, flowers, or fruits arise from the same point at the end of the main stem or of a side shoot (often very short and scarcely perceptible), they are said to be in a cluster. (Fig. 94 H and J.) A flower-cluster of this kind is called an *umbel*, a term not used in this book (Fig. 120 A shows a *compound umbel*.) To avoid technicalities the term *branched cluster* is

EXPLANATION OF THE TERMS USED

applied generally in this book to any group of flowers having a common stalk, but not coming under the definition of a raceme or panicle ¹

COMPOUND LEAF When the blade of a leaf is divided into two or more separate leaflets, each with its own stalk or independent base, the leaf is said to be compound. That the leaflets themselves are not leaves is shown by the absence of buds in their axils, also the whole leaf can be pulled off as one, leaving a well-defined scar on the stem (Figs 1-23)

COROLLA (C) The petals taken together. Denoted in the floral formulae by the letter C.

DECIDUOUS (D) Falling off, not persistent. A deciduous tree or shrub is one which normally loses all or most of its leaves, i.e. becomes bare, during a definite season of the year, usually the winter.

DICOTYLEDON. See page 143

DIGITATE Used in this book of a compound leaf of 2, 4, or more leaflets, which all arise from approximately the same point at the end of the common stalk. (A leaf of 3 leaflets can also be digitate, but the distinct term *3-foliate* has been used here for such leaves owing to their large number) (Figs 4-6.)

EMBRYO The rudimentary or 'unborn' plant tucked away inside the seed before germination.

ENTIRE. Without teeth or lobes.

EVERGREEN (E). Clothed with leaves throughout the year, not deciduous. Plants that are normally leafless are also described as evergreen when the branches or any other parts assuming the functions of leaves remain green throughout the year, e.g. gorse and broom.

FLACCID Not stiff or rigid.

FLORAL FORMULA. A method of compressing information, used by botanists for many years. K stands for the calyx, C for the corolla, A for the stamens, and G for the pistil. \overline{G} means that the pistil has a superior ovary (see *Ovary*), \underline{G} an inferior ovary, $\overline{\underline{G}}$ that both superior and inferior ovaries may be present. The figure after each indicates the number of parts of which it is composed; if the figure is enclosed in brackets the parts are all joined together, i.e. they cannot be pulled off separately without tearing. For instance, the floral formula of the family *Diapensiaceae* is $K(5), C(5), A_5, \overline{G}(3)$, which means that the flowers of this family have 5 united sepals, 5 united petals, 5 separate stamens, and a superior pistil formed by the union of three originally separate parts (carpels). Other symbols used are: P (perianth), ∞ for numerous or an indefinite number, and + inserted between figures to show the separation of the parts into two or more layers or whorls.

G. See *Floral Formula and Pistil*

GENUS Plural *genera*, adjective *generic*. The genus of a plant is indicated by the first of its two Latin names, e.g. in *Quercus coccinea* the tree belongs to the genus *Quercus*. *Quercus* is the generic name, *coccinea* the specific name (see *Species*). There is no absolute rule as to what constitutes a genus. All that can be said is that species which show several distinct characters in common are usually grouped together in one genus. In *Quercus* (Oak) the most easily recognizable common character is the acorn. Allied genera are grouped into *Families*,

¹ A branched cluster, in which the central flowers open first, is known as a *cyme*. (Fig. 65 H.) When the outer flowers open first it is a *corymb* (Fig. 93 H.) These terms have not been used in this book, for they are often difficult to determine.

families into *Orders* (not referred to in this book), orders into *Sub-classes*, sub-classes into *Classes*, and classes into *Subdivisions* (For convenience Gymnosperms and Cryptogams are ranked as Classes in this book, though they are really subdivisions)

GLAND. A small swelling often found on leaves or other parts of plants, and usually secreting oil or some other substance

GLAUCOUS. Covered with bloom (like a plum) or grey or white substance as distinct from hairs.

GRAFT. The artificial union of two different kinds of tree or shrub by making an incision in one and inserting a small branch of another. In the vast majority of cases the two kinds thus united retain their distinctive characters. Where they do not, the result is known as a *graft hybrid*. The best-known instance of this is the Purple Laburnum, which is the result of grafting the Purple Broom on the Common Laburnum

HEAD. A dense cluster of flowers or fruits.¹ (Figs. 14 E and 30 A and B)

HYBRID. When the flowers of one kind of tree or shrub are fertilized by the pollen from another kind—it may be a different variety, or species, or even genus—the resulting offspring, if any, is termed a hybrid. Hybrids, while usually combining the characters of both parents, often reveal entirely new characters, such as more luxuriant growth, or showier and more abundant flowers; on the other hand, they seldom breed true, if they breed at all, and have to be increased by division. Most of the hybrids included in this book are important enough in the garden and field to be treated as separate species, though botanically they cannot be regarded as such. A *natural hybrid* is one produced without the conscious agency of man; they are very common, for instance, among the willows, poplars, elms, and veronicas, and make it much more difficult to sort out the species belonging to these genera

K. See *Floral Formula* and *Calyx*

LANCE-SHAPED (lanc.) Shaped like a lance head, i.e. with curved edges narrowing at the base and apex and much longer than broad. If a leaf is at least three times longer than broad, it can be taken as lance-shaped for the purposes of this book, regardless of its actual outline (but see *Linear* and *Ovate*) (Figs. 40 and 58 D.)

LATERAL. At the side, as opposed to terminal.

LEAFLET (lft.). See Compound Leaf

LINEAR. Long and very narrow, with nearly parallel margins and narrowing at the base, e.g. a blade of grass. (Figs. 50–53)

LOBED. Divided into segments the spaces between which do not reach the axis or centre. There is no hard and fast distinction between lobes and large teeth. (Figs. 23–36.)

MIDRIB. The largest vein of a leaf, usually running lengthwise along the axis from base to apex.

MONOCOTYLEDON. See page 282. As the term is used in the key to the illustrations, a few words here may not be out of place. The term covers a large class of closely allied plants. Every gardener knows how the seeds of grasses, onions, and leeks send up a single narrow leaf instead of the double and multiple leaf of most other seeds. It is this character which gives the class its name

¹ A head formed of stalkless flowers borne on the swollen end of the axis is known as a *capitulum*. (Figs. 67 D and 99 L.)

(*mono*, one; *cotyledon*, seed leaf). Monocotyledons can be recognized in later life by the leaves or leaflets being usually long and narrow, and nearly always without a conspicuous network of veins. Very few are trees or shrubs. Not one of the trees is a native of Europe, and only two shrubs. Butcher's Broom and *Asparagus*. Not more than twenty genera of monocotyledons have been included in this book, and most of these are unmistakable on account of their tropical or grass-like appearance. Of the remainder *Smilax* and *Lapageria* are climbers, while only *Philesia* and the Alexandrian Laurel, in addition to those already mentioned, are shrubs. (All except the palms and banana are illustrated in Figs. 38-40, which should be referred to in cases of doubt)

NERVES. The chief veins.

OB-. When the half towards the apex is broader than the half towards the base, as in the pear or fig. *Oblance-shaped* (oblong) and *obovate* (obov) mean, therefore, inversely lance-shaped and inversely ovate, i.e. the narrow end is towards the point of attachment. (Fig. 74 L)

OBLONG. Ovate or lance-shaped with sides nearly parallel, except at the base and apex. Used also of fruits with approximately straight sides, i.e. neither egg-shaped nor pear-shaped. (Figs 40 D and 88 L)

OPPOSITE. Arising in pairs from the same level, but on opposite sides.

OVARY. The hollow chamber formed by the growth of the basal part of the carpel, and completely enclosing one or more ovules. An ovary may be formed by one carpel or by the union of several. It is said to be *superior* (Fig. 82 c) or *inferior* (Fig. 94) when it is in a position above or below the insertion of the stamens and other floral parts. Usually there is no difficulty in deciding this, but sometimes, and particularly in the rose family, the ovaries may be borne in a hollow cup, above or outside which the other floral parts are inserted. Where the cup is definitely hollow, i.e. where there is a clear space between the ovary and the sides of the cup, as in the plum and cherry (Figs 90 and 91), the ovary must be treated as superior. Where there is partial (Fig. 58 A) or complete (Fig. 58 D) fusion, the ovary must be treated as inferior.

OVATE (ov) Shaped like an egg, i.e. with curved sides narrowing at the base and apex. In this book any leaf narrowing to the stalk and less than three times longer than broad, regardless of its actual outline. For example, 'Leaf ov, 3-5-lobed' means that the leaf is less than three times longer than broad, and would be egg-shaped if the spaces between the lobes were filled up. The same applies to leaves described as lance-shaped or linear. (Fig. 35)

OVULES. Tiny seed-like bodies, which may be seen when the ovary is dissected or cut through (in conifers and shrubby horsetails the ovules are not enclosed in an ovary; in the tree fern there is none). It is from the ovules, after they have been fertilized by the pollen, that the seeds develop. (Fig. 82 c.)

P. See *Floral Formula* and *Perianth*.

PALMATE. Arranged like the fingers of a hand, i.e. arising from approximately the same point and spreading outwards.

PALMATELY LOBED. Where the midribs of the lobes are palmately arranged. (Fig. 23.) This is an important point in the key. For example, the leaf of the Wild Service Tree (*Sorbus torminalis*) appears at first sight to be palmately lobed, and is so described in some books, but a reference to Fig. 36 K shows that the midribs of the lobes are not palmately arranged; the leaf is therefore pinnately lobed. (Figs. 23-31.)

- PALMATELY VEINED** Where the chief veins of the leaf are palmately arranged. (Fig 38 G)
- PANICLE** A branched raceme, i.e. a raceme in which the common stalk sends off lateral branches, which may themselves branch. The largest branches are usually at the base, giving the panicle a roughly pyramidal shape. (Fig 69.) A flattened panicle becomes a *corymb* (see footnote on page 4). A group of flowers may take the form of a panicle without being a branched raceme, e.g. in the Privet. The term panicle, therefore, can be taken to mean any loose and open group of flowers, which has a roughly pyramidal outline, and this is the sense in which it has been used in this book.
- PELTATE** Attached to the stalk by the centre or one face, and not by the end, as in the leaf of a nasturtium (Figs 31 B and 44 H.)
- PERIANTH (P)** The outermost floral parts, or floral envelope, i.e. the calyx and corolla, especially when there is no clear distinction between the two, or when one or the other is absent (Figs. 113 D and 127 A-D) Denoted in the floral formulae by the letter P.
- PERSISTENT** Remaining attached, not falling off
- PINNATE**. Arranged like the divisions of a feather or herring-bone, i.e. arising from opposite sides of a common axis. Used of compound leaves with pinnate leaflets. If the leaflets of a pinnate leaf are themselves simple, the leaf is said to be *simply pinnate* (Figs. 7-17.) If, however, they are divided into secondary pinnate leaflets, the leaf is *2-pinnate*. (Fig. 18 F) If these secondary leaflets are again divided, the leaf is *3-pinnate*.
- PINNATELY LOBED**. Where the midribs of the lobes are pinnately arranged (Figs. 32-36)
- PINNATELY VEINED** Where the chief side veins arise at intervals from opposite sides of the midrib. (Fig 58 D.)
- PISTIL (G)**. The organs in the centre of the flower, from which the seed and fruit directly develop, i.e. the carpel, or carpels taken together, the female organs. The pistil includes the ovary, style, and stigma, but not the stamens (Fig. 82 C.) Denoted in the floral formulae by the letter G (from the Greek word *gynoecium*, female part).
- POLLEN**. The yellow dust-like grains that are produced by the stamens (male organs), and fertilize the ovule. They are usually conveyed to the pistil by wind or insects.
- PROSTRATE**. Lying on or near the ground.
- RACEME**. A group of flowers on a common axis, each flower being stalked and generally in the axil of a bract. The oldest (fully open) flowers will be found near the bottom of the axis, and the youngest (unopened buds) at the top. It follows that the common stalk of a raceme can be clearly traced through the group as a more or less straight line from base to apex. (Fig 90 F) See also *Panicum*.
- RADIAL**. Spreading outwards on all sides at approximately the same level like the spokes of a wheel.
- RECEPTACLE**. The swollen head of the flower-stalk, on which the floral organs, or in the case of a capitulum the flowers, are inserted. In the rose, plum, and cherry family the receptacle is converted into a cup enclosing the pistil, while the sepals, petals, and stamens grow from the rim.
- RECURVED**. Curved downwards or backwards. Also *reflexed*.
- ROUND**. Shaped like a ball or a circle.

SIMPLE. Not compound A leaf is simple when it is not divided into leaflets.

SOLITARY. When one flower only is found in the axil of a normal leaf or at the end of a shoot

SPECIES Plants which, given the same conditions of growth, show no structural difference from one another usually belong to the same species. Also, if the seed is sown, the vast majority of the offspring will be practically the same as the parents Occasionally, however, there may be a marked difference in one or two individuals. If these hand on their peculiar features to their offspring, a new species is formed, if they do not, we call the new kind a *variety* Generally speaking, therefore, a species breeds true, while a variety does not. Sometimes, however, it is not easy to say whether a plant should be considered a variety or a separate species Moreover, a too literal interpretation of the breeding rule would lead to a vast number of new species which to the ordinary man would be practically indistinguishable from one another. The whole question of species, varieties, and *forms* (differences due to differing conditions of growth) is largely a matter of opinion. When different species hitherto isolated by distance or environment are brought together, they may lose their specific characters and behave as varieties, or even forms. On the other hand, we know that there is some factor in the seed, seemingly independent of outside circumstances, which causes like to breed like, though exactly what it is no one knows In this book the number of species has been kept as small as possible by classing the minor differences as varieties and generally ignoring the scientific arguments for ranking them as species.

SPIKE. Used generally for a long and narrow raceme, but strictly speaking a raceme in which the individual flowers are stalkless. (Fig. 66 A.)

✓ **STAMENS (A).** The special (male) organs of the flower concerned with the production of pollen. They usually consist of several to many thread-like bodies, each bearing at its end a pair of small yellow lobes (the anther), which contain the pollen. At the time of fertilization the anther lobes split open and discharge the pollen, or, as in the heath and rhododendron family, the pollen is discharged through apical pores The stalk is known as the filament (Fig. 82 c) Denoted in the floral formulae by the letter A (from the Greek word *androecium*, male part)

STIGMA The extreme outer end of the style. (Fig 82 c.) When the flower is ripe for fertilization, the stigma is often sticky or feathery for the purpose of catching and retaining the pollen. (Fig 82 c.)

STIPULE An appendage at the base of the leaf-stalk, usually one on each side and often leaf-like. The small scar left by its fall is an important point in identification. (Figs 11 A and 90 A.)

STYLE. An extension upwards of the ovary for the purpose of exposing the stigma for the reception of pollen (Fig. 82 c.)

SUB-OPPOSITE Nearly but not quite opposite (Fig 69 A.)

TENDRIL. A coiled thread by which a climbing plant grasps an object for support.

TERMINAL. At the end, as opposed to lateral.

THREE-NERVED (3-nerved). A 3-nerved leaf is one in which three of the chief veins, usually the midrib and two side veins, are much larger than all the others. (Figs. 65 c and 68 j) It is usually palmately veined, but not always so. (Fig. 126 c and h.)

TOOTHED. Evenly (Fig. 83 A and B). Unevenly (Figs. 82 H and 83 K). Closely (Fig 83 B). Distantly (Fig. 83 E and G). Finely (Fig. 83 J). Coarsely

(Fig. 83 G). Minutely (Fig. 83 E). Round- (Fig. 93 B). Double- (Fig. 92 J).

Sharp (Fig. 94 C and K). Blunt (Fig. 94 F).

TRIFOLIOLATE (3-fol.). A compound leaf with three leaflets.

UNDULATING. When the outline of a leaf is curved into a series of shallow bays not pronounced enough to be called teeth or lobes. (Fig. 98 B.)

UNISEXUAL. Of one sex only. A flower or catkin with stamens, but without, or with rudimentary pistil is called *male* (Fig. 81 B); one with a pistil, but without, or with rudimentary stamens is *female* (Fig. 81 A). A flower possessing both is *bisexual* (Fig. 81 E).

VARIETY. See *Species*.

WAVY. When the margin of a leaf is crinkled or folded in a vertical plane, as distinct from undulating, where the curvature is in a horizontal plane. (Fig. 120 M.)

WHORL. A group of three or more stems, leaves, or flowers arising from the same level on all sides of the main axis. (Fig. 55.)

DIAGRAMS

DIAGRAMS

KEY

FIGS.

Trees and shrubs with *compound* leaves.

3-foliolate leaves

Opposite leaves 1 A-J

Alternate leaves 1 K-3

Digitate leaves 4-6

Pinnate leaves:

Simply pinnate leaves:

Opposite leaves 7-9 D

Alternate leaves 9 E-17

2- or 3-pinnate leaves (sometimes simply pinnate) . . . 18-23

Trees and shrubs with normally *simple* or *no* leaves (if the leaves are compound, they are very small beyond the seedling stage).

Lobed leaves.

Palmately lobed leaves:

Opposite leaves 23-26 C

Alternate leaves 26 D-31

Pinnately lobed leaves 32-36

Leaves normally *absent* or nearly so¹ 37

Monocotyledons with simple leaves 38-40

Conifers (resinous plants with needle-like or scale-like leaves, including pines, firs, yews, cedars, cypresses, and junipers) 41-47

Non-coniferous *heath-like* shrubs with leaves not usually longer than $\frac{1}{4}$ inch 48-49

Trees and shrubs with simple *linear* leaves, not included in any of the above groups 50-53

Trees and shrubs with simple *opposite* or *whorled* leaves, not included in any of the above groups:

Prickly or spiny 54

Toothed leaves:

Leaves in whorls 55

Leaves in opposite pairs 56-64

Entire leaves 65-77

Trees and shrubs with simple *alternate* leaves or leaves in *alternate clusters*, and not included in any of the above groups:

Toothed leaves 78-111

Entire leaves² 112-128

¹ Deciduous trees and shrubs can only be tested in the leaf-bearing season.

² See also Figs. 79 J and K, 95 G and 97 M.



FIG. 1

- A. *Clematis montana*
 B. *Acer griseum*
 C. Box Elder, *A. Negundo*
 D. *Acradema Franklinae*
 E. Mexican Orange Blossom, *Choisya ternata*
 F. Winter Jasmine, *Jasminum nudiflorum*
 G. Primrose Jasmine, *J. primulinum*
 H. *Pithecoctenium muricatum*
 I. *Lardizabala bitermata*
 J. Leaf of *Forsythia* (see Fig. 60 A)
 K. *Holboellia coriacea*
 L. *Anagyris foetida*
 M. *Lardizabala bitermata*
 N. *Sinofranchetia sinensis*

(Flowers and fruits of M after Le Maout and Decaisne and *Botanical Magazine*.)



FIG. 2

A. *Acanthopanax lasiogyne*D. *Sargentodoxa cuneata*G. Coral Tree, *Erythrina*
*Crista-galli*B. Lawyer Vine, *Rubus*
*australis*E. Dewberry, *Rubus caesius*H. *Cytisus Battandieri*C. Hop Tree, *Ptelea tri-*
*foliata*F. Fragrant Sumach, *Rhus*
*aromatica*J. *Akebia lobata*K. *Psoralea glandulosa*

(D after Hutchinson.)



FIG. 3

A. Hardy Orange, *Aegle sepiaria*

B. Evergreen Laburnum, *Pyptanthus nepalensis*

C. Common Laburnum, *Laburnum vulgare*

D. Poison Ivy, *Rhus Toxicodendron*

E. *Adenocarpus decorticans*

F. *Cytisus nigricans*

G. Shrubby Restharrow, *Ononis fruticosa*

H. Dalmatian Laburnum, *Petteria ramantacea*

J. Tick Trefoil, *Desmodium tiliaefolium*

K. Moon Trefoil, *Medicago arborea*

L. Bush Clover, *Lespedeza Sieboldii*

(Genera not figured: *Pueraria*, *Rosa*, *Vitis*)

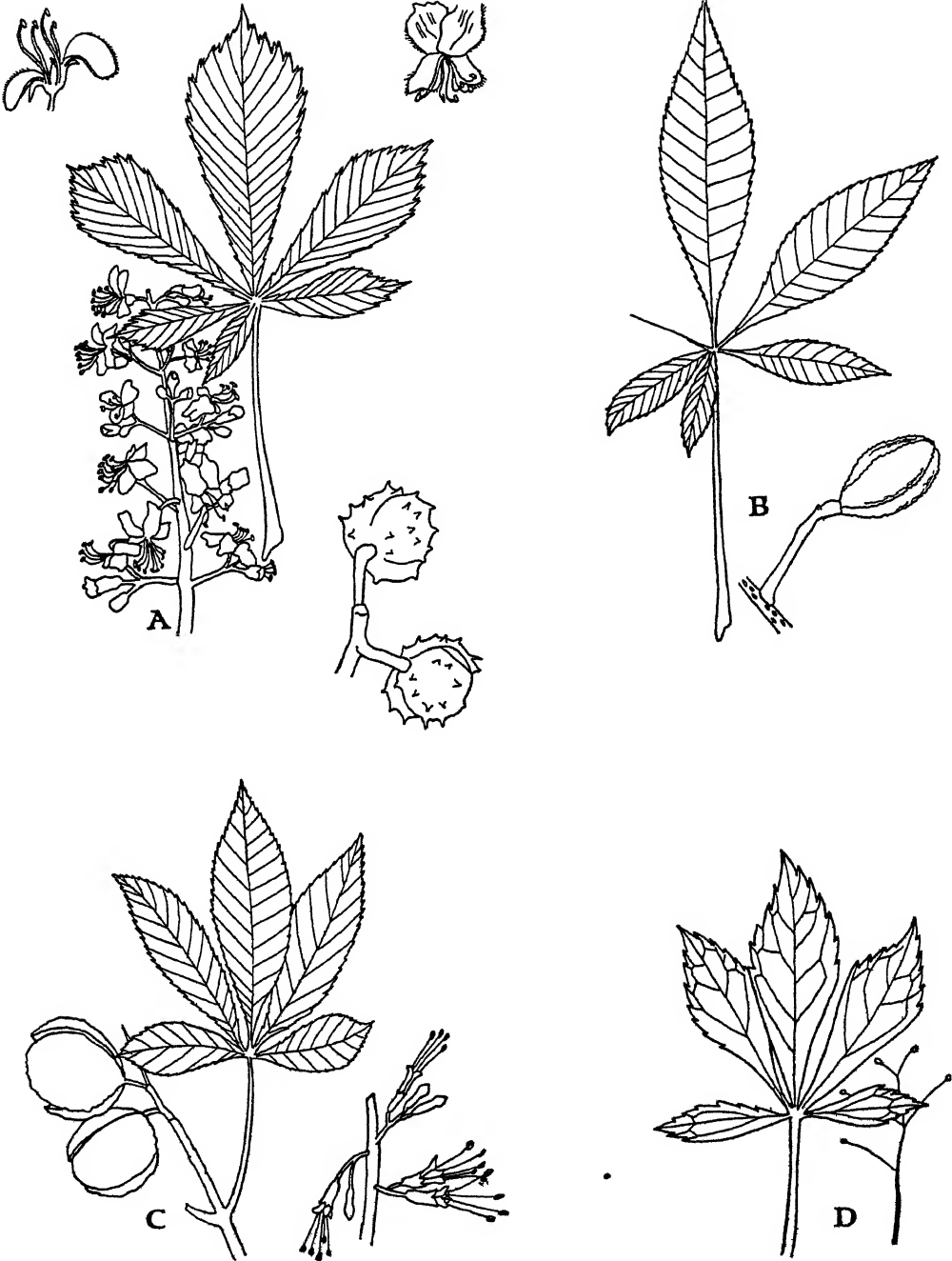


FIG. 4

A. Common Horse-chestnut, *Aesculus Hippocastanum*

B. Indian Horse-chestnut, *A. indica*

C. Shrubby Pavia, or Dwarf Buckeye, *A. parviflora*

D. True Virginia Creeper, *Vitis quinquefolia* (*Ampelopsis hederacea*)



FIG. 5

- | | | |
|---------------------------------|---------------------------------------|--------------------------------|
| A. <i>Stauntonia hexaphylla</i> | D. Chaste Tree, <i>Vitex Ag-</i> | H. <i>Vitex Negundo</i> |
| B. Japanese Maple, <i>Acer</i> | <i>mus-castus</i> | J. <i>Nothopanax arboreum</i> |
| <i>palmatum</i> , variety | E. <i>Hardenbergia</i> <i>Compto-</i> | K. Tree Lupin, <i>Lupinus</i> |
| <i>dissectum</i> | <i>niana</i> | <i>arboreus</i> |
| C. <i>Dorycnium hirsutum</i> | F. <i>Caragana frutescens</i> | L. <i>Acanthopanax Simonii</i> |
| | G. <i>Akebia quinata</i> | |

(Flowers of A after *Gardener's Chronicle*.)

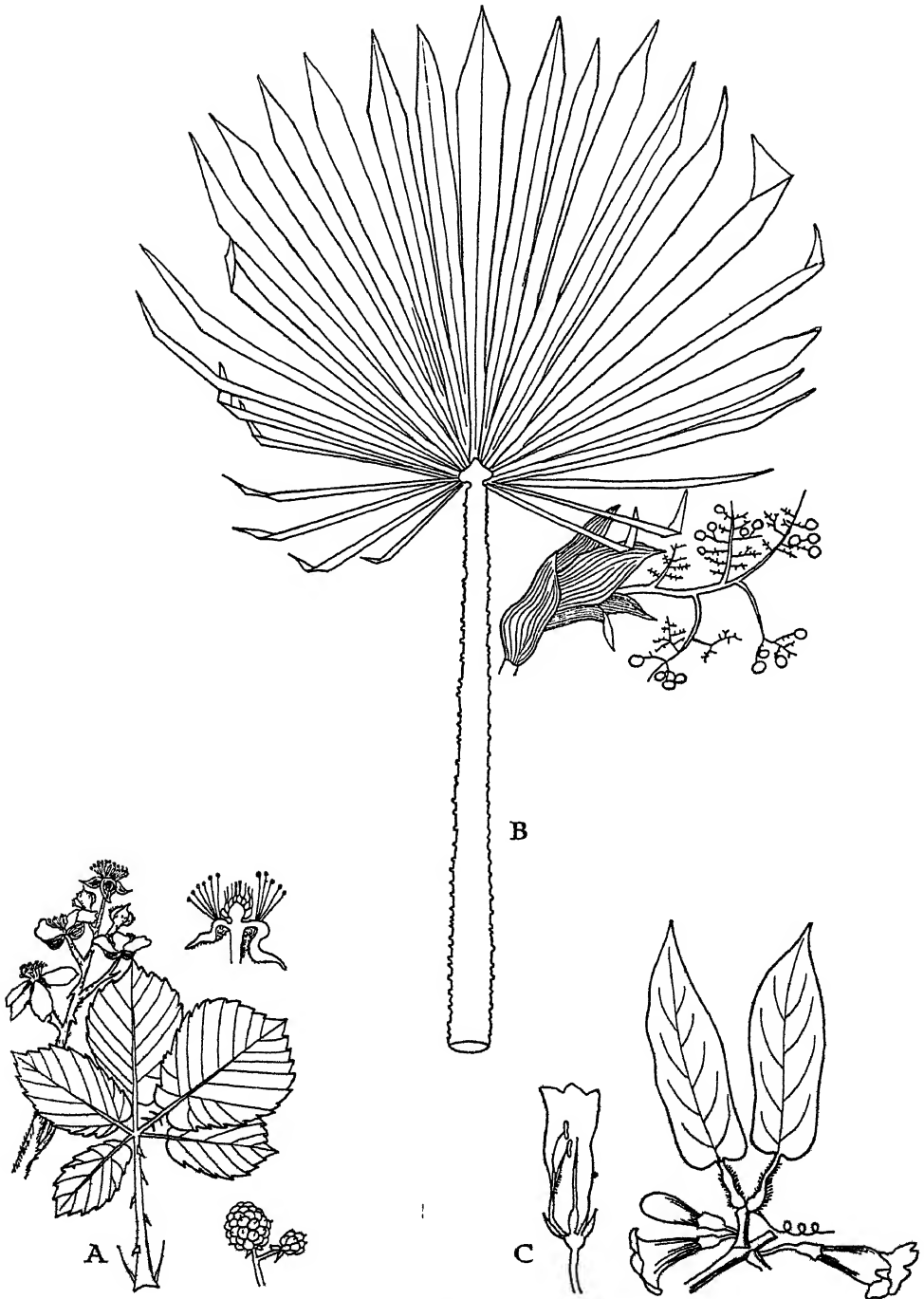


FIG. 6

A. Blackberry, Bramble, *Rubus fruticosus*

B. Chusan Palm, *Chamaerops excelsa*

C. Cross Vine, *Bignonia capreolata*

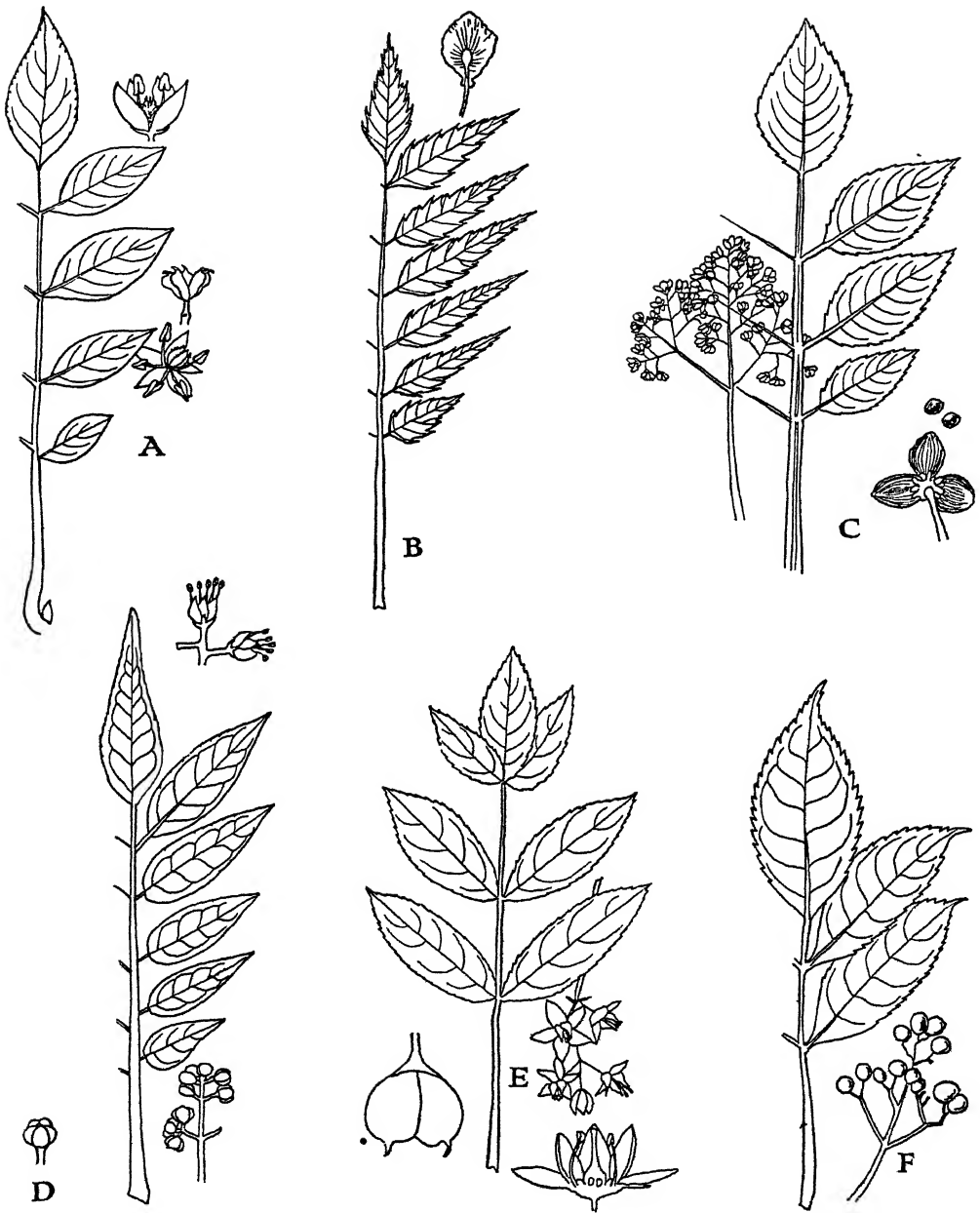


FIG. 7

A. *Evodia Daniellii*B. *Dipteronia sinensis*C. *Euscaphis staphyleoides*D. Amur Cork Tree, *Phellodendron amurense*E. Bladder Nut, *Staphylea colchica*F. *Turpimia nepalensis*



FIG. 8

- A. Common Ash, *Fraxinus excelsior*
 B. Flowering Ash, or Manna Ash, *F. ornus*
 C. Maries's Flowering Ash, *F. mariesii*
 D. *Weinmannia trichosperma*
 E. Pinnate Lilac, *Syringa pinnatifolia*
 F. Common Elder, *Sambucus nigra*
 G. Plumed Red-berried Elder, *S. racemosa*, variety *plumosa*
 H. Flowers of Elder (Genus not figured: *Lyonothamnus*)



FIG. 9

- | | | |
|--|--|--|
| A. Common Jasmine, or
Jessamine, <i>Jasminum</i>
<i>officinale</i> | D. Traveller's Joy, or Old
Man's Beard, <i>Clematis</i>
<i>Vitalba</i> | G. Japan Pepper, <i>Z. piperi-</i>
<i>tum</i> |
| B. Brush Bush, <i>Eucryphia</i>
<i>pinnatifolia</i> | E. <i>Zanthoxylum alatum</i> | H. Chian Turpentine Tree,
<i>Pistacia Terebinthus</i> |
| C. Trumpet Flower, <i>Tecoma</i>
<i>radicans</i> | F. Toothache Tree, <i>Z</i>
<i>americanum</i> | J. <i>Picrasma ailanthoides</i> |

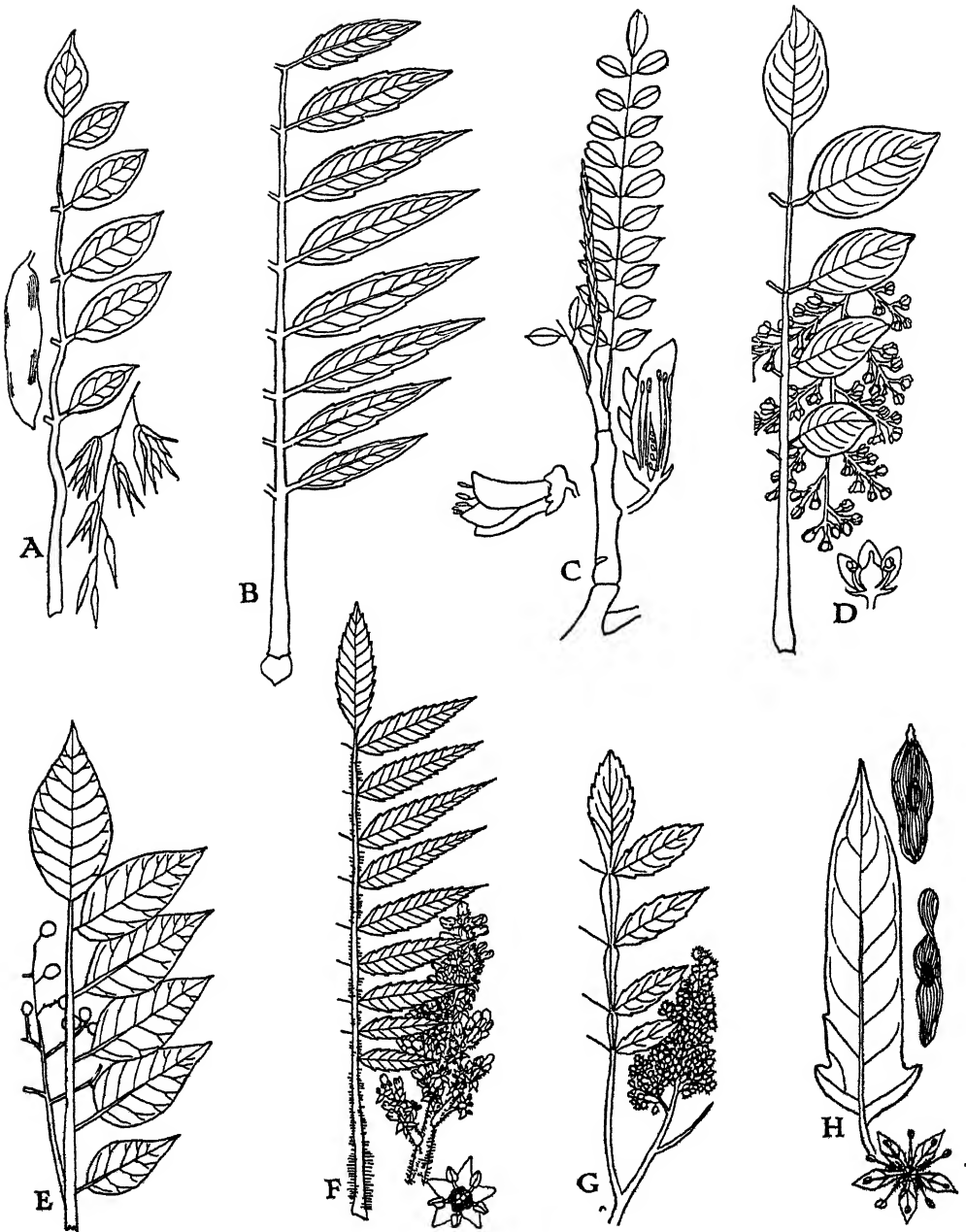


FIG. 10

A. *Decaisnea Fargesii*B. *Cedrela sinensis*C. *Edwardsia grandiflora*D. *Meliosma Veitchiorum*E. Lacquer or Varnish Tree
*Rhus verniciflua*F. Stag's Horn Sumach, *R.*
typhina

(G after Sargent.)

G. Shining Sumach, *R.*
*copallina*H. Leaflet, flower, and fruits
of Tree of Heaven,
Ailanthus glandulosa



FIG. II

- A. Mountain Ash, or Rowan, *Sorbus Aucuparia*
 B. Service Tree, *S. domestica*
 C. Mockernut (a hickory), *Carya alba*
 D. Chinese Wing Nut, *Pterocarya stenoptera*
 E. Leaflets and fruit of Caucasian Wing Nut, *P. caucasica*
 F. Common Walnut, *Juglans regia*
 G. Black Walnut, *J. nigra*
 H. Chinese Pistachia, *Pistacia chinensis*
 I. Soapberry, *Sapindus Drummondii*



FIG. 12

A. *Xanthoceras sorbifolia*B. *Jasminum revolutum*C. *Solanum jasminoides*D. Mastic Tree, *Pistacia*
*Lentiscus*E. Leaflet of *Mahonia nepalensis*F. Leaflet of Oregon Grape,
*M. Aquifolium*G. Leaflet of *M. japonica*H. Raspberry, *Rubus Idaeus*J. *Spiraea Lindleyana*K. Leaflet of *S. arborea*



FIG. 13

- A. *Wistaria sinensis*
 B. Yellow Wood, *Cladrastis tinctoria*
 C. *Maackia amurensis*
 D. *Calophaca vulgarica*
 E. *Caragana Chamlagu*

- F. False Indigo, *Amorpha fruticosa*
 G. False Acacia, or Locust Tree, *Robinia Pseud-acacia*
 H. Wild Senna, *Cassia marylandica*

- J. Pea Tree, *Caragana arborescens*
 K. Salt Tree, *Halimodendron argenteum*
 L. *Coronilla glauca*
 (Genus not figured: *Calpurnia*)

(Flowers of B after Sargent.)



FIG. 14

- | | | |
|---|---|---|
| A. <i>Indigofera Gerardiana</i> | F. Scorpion Senna, or
Crown Vetch, <i>Coronilla Emerus</i> | J. Glory Pea, or Parrot's
Bill, <i>Clanthus puniceus</i> |
| B. Rose Acacia, <i>Robinia Kelsey</i> | G. Bladder Senna, <i>Colutea arborescens</i> | K. Shrubby Cinquefoil,
<i>Potentilla fruticosa</i> |
| C. Pagoda Tree, <i>Sophora japonica</i> | H. Goat's Thorn, <i>Astragalus Tragacantha</i> | L. <i>Osteomeles anthyllidifolia</i> |
| D. <i>S. viciifolia</i> | M. French Honeysuckle,
<i>Hedysarum multijugum</i> | |
| E. Jupiter's Beard, or Silver
Bush, <i>Anthyllis Barba-Jovis</i> | | |

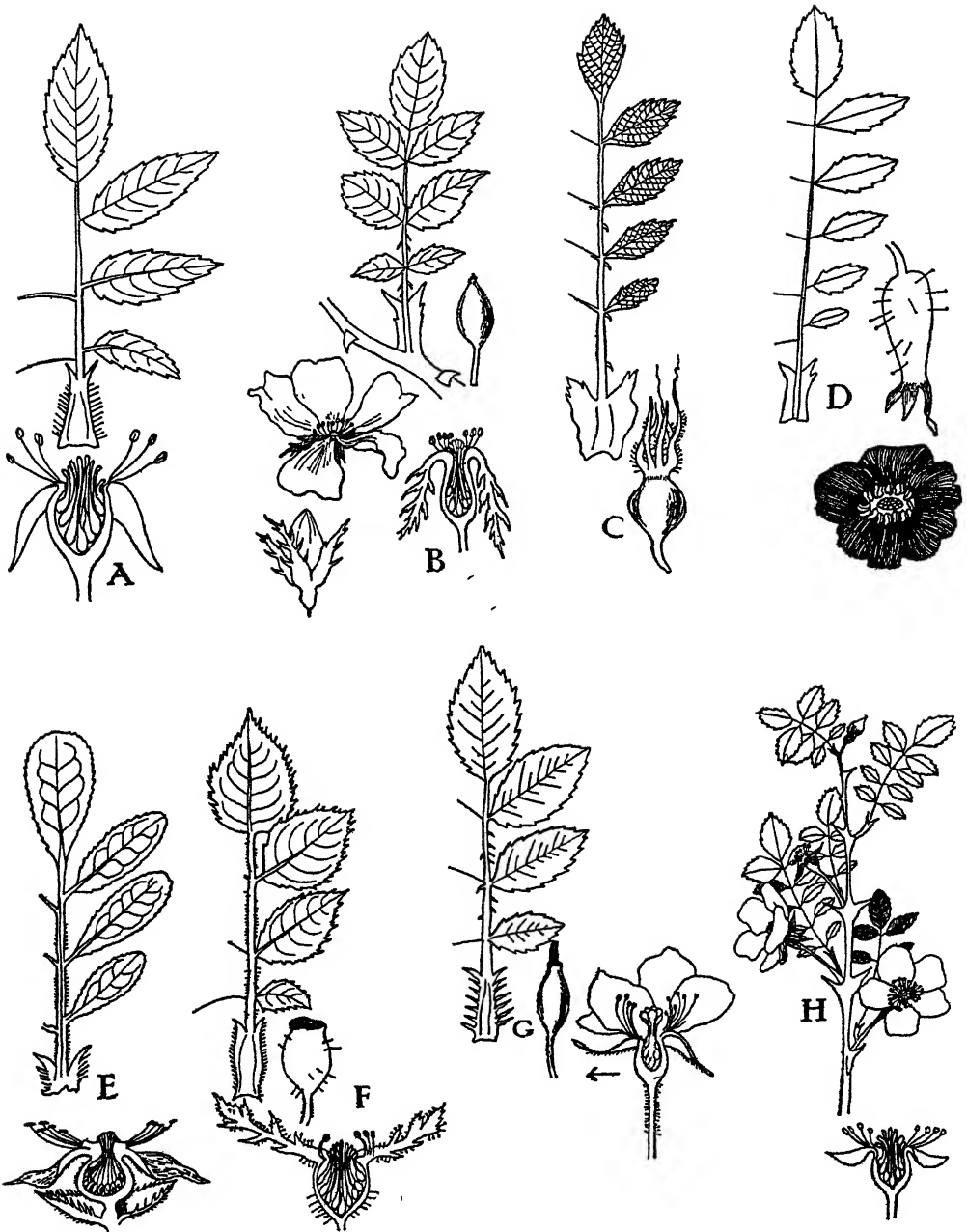


FIG 15

- | | | |
|---|--|---|
| A. Chinese or Monthly
Rose, <i>Rosa indica</i> | C Ramanas Rose, <i>R. rugosa</i> | F. Sweet Briar, or Eglan-
tine, <i>R. rubiginosa</i> |
| | D <i>R. Moyesii</i> | |
| B. Dog Rose, <i>R. canina</i> | E. Macartney Rose, <i>R. bracteata</i> | G. <i>R. multiflora</i> |
| | | H. <i>R. Hugonis</i> |

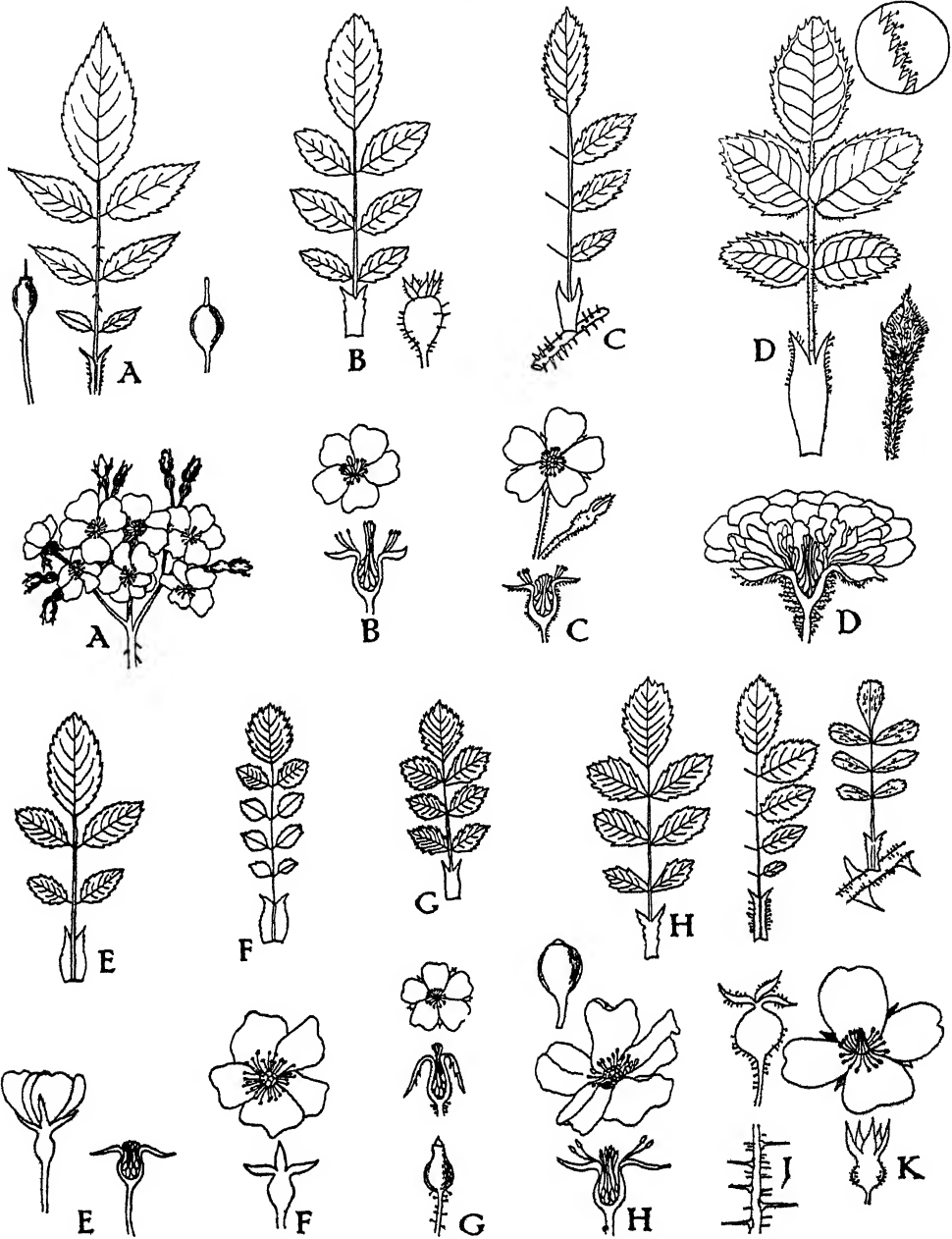


FIG. 16

- A. Musk Rose, *R. moschata* D. Moss Rose, *R. centifolia*, variety *muscosa* G. Small-flowered Briar, *R. micrantha*
 B. Trailing Wild Rose, *R. arvensis* E. Irish Rose, *R. hibernica* H. Austrian Briar, *R. foetida*
 C. Downy Rose, *R. villosa* F. Scotch or Burnet Rose, *R. spinosissima* J. Sabine's Rose, *R. involuta*
 K. *R. sericea*
 (C after Butcher and Strudwick.)

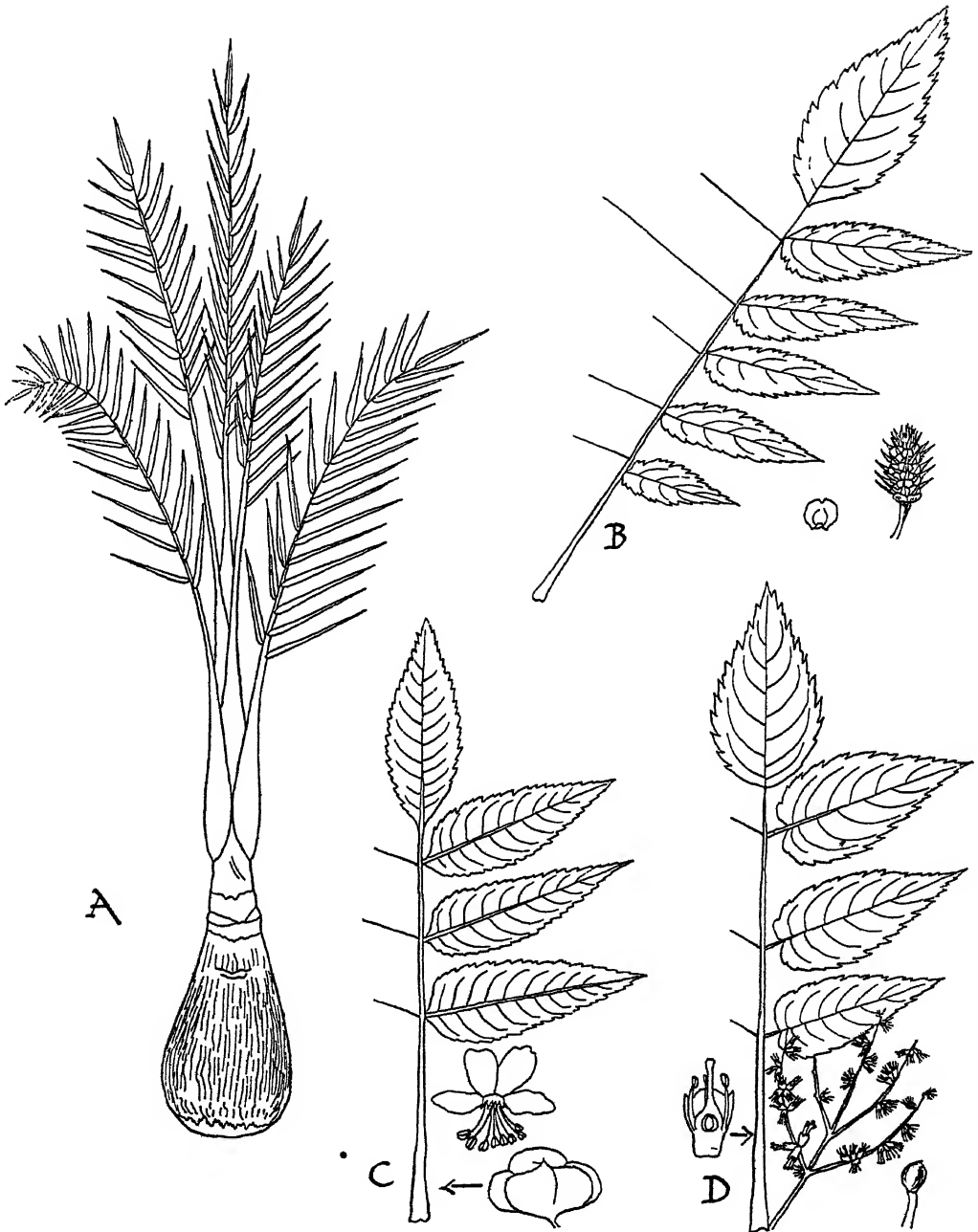


FIG. 17

A. Wine Palm, *Jubaea spectabilis*
 B. *Platycarya strobilacea*

C. Mexican Buckeye, *Ungnadia speciosa*
 D. *Tapiscia sinensis*

(C after *Flore des Serres*.)

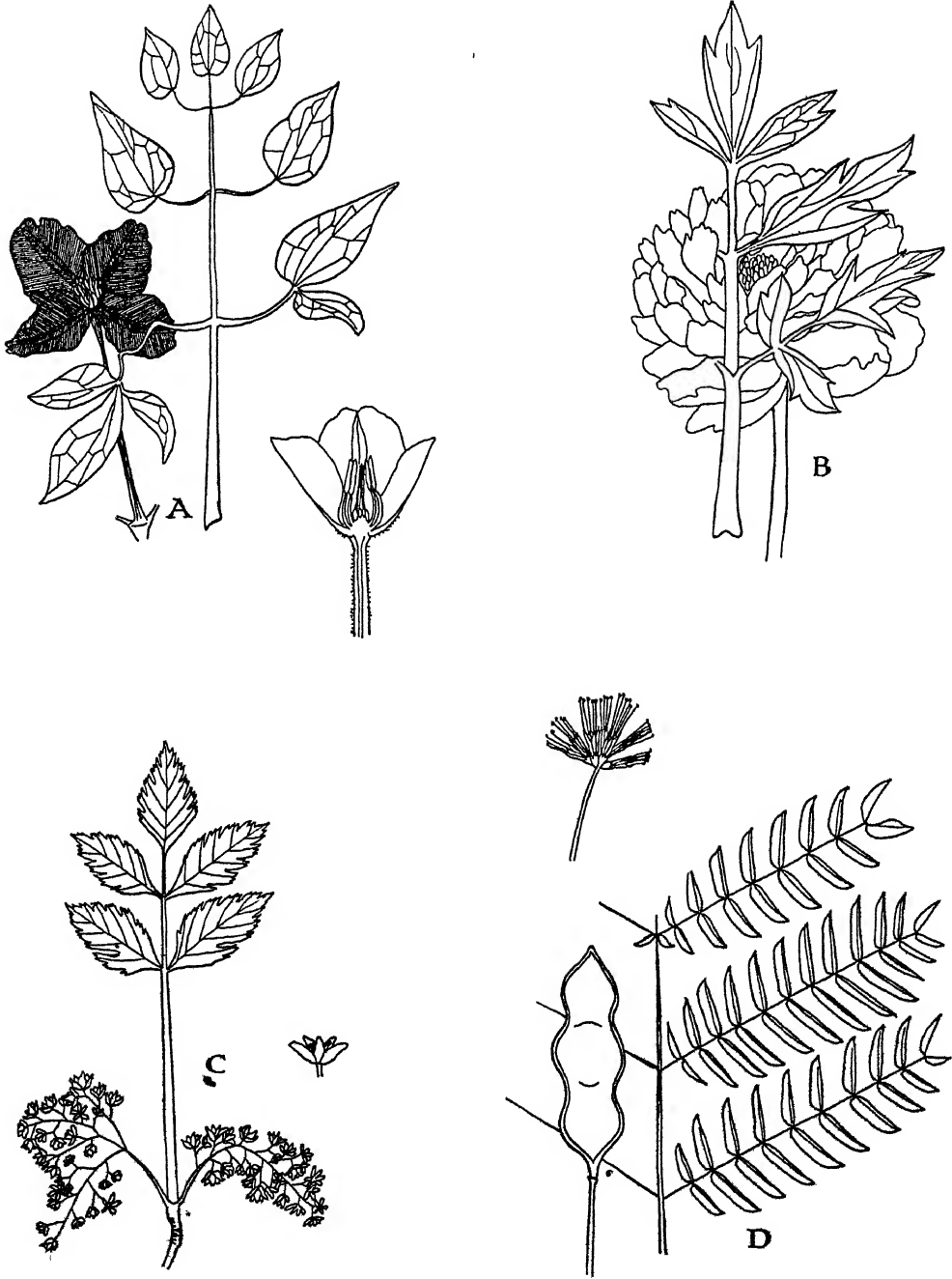


FIG. 18

A. *Clematis Jackmannii*
 B. *Tree Paeony, Paeonia Moutan*

C. *Yellow-root, Zanthorrhiza apifolia*
 D. *Pink Siris, Albizzia julibrissin*

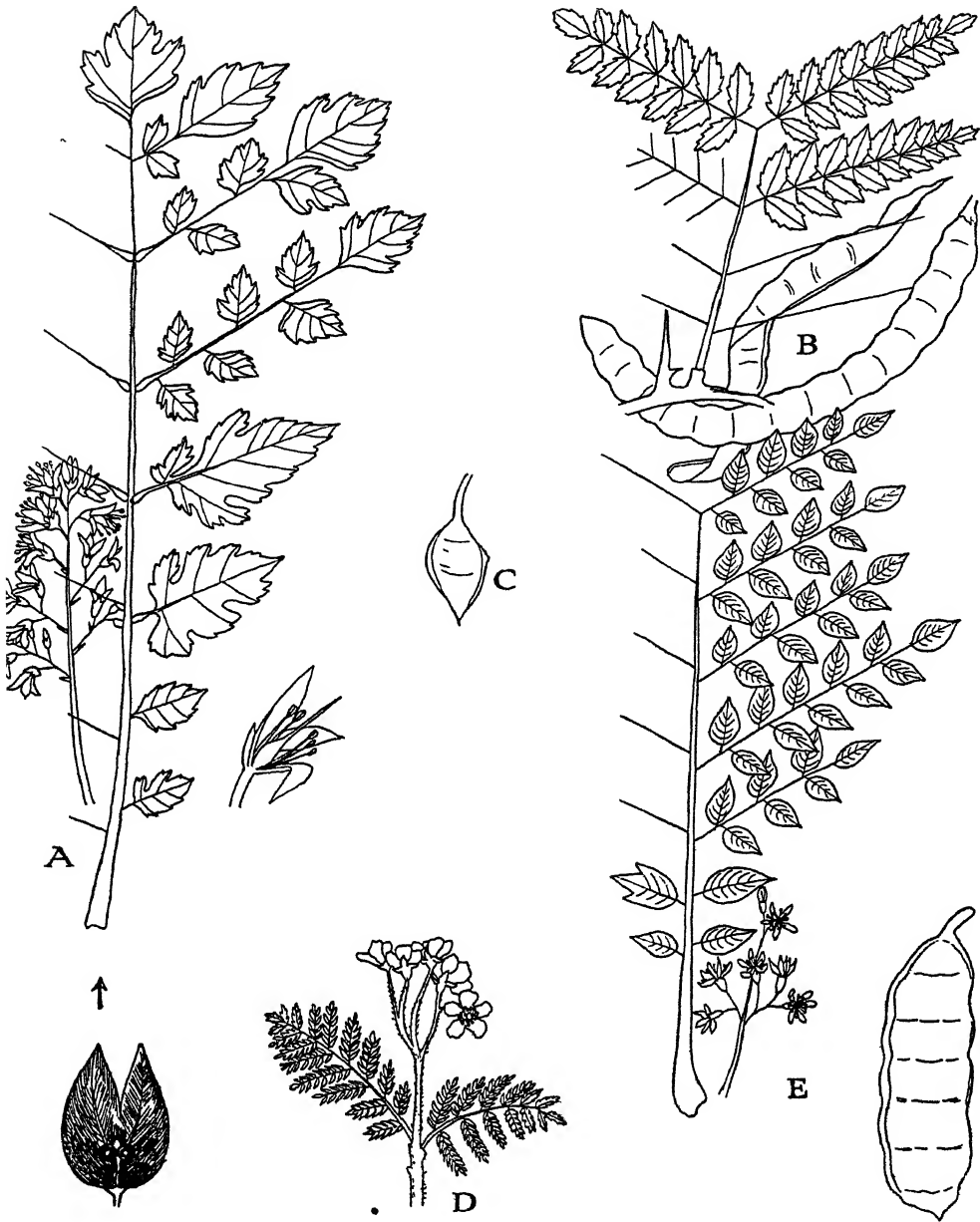


FIG. 19

A. Pride of India, *Koelreuteria paniculata*

B. Honey Locust, *Gleditsia triacanthos*

C. Fruit of Water Locust, *G. aquatica*

D. *Chamaebatia foliolosa*

E. Kentucky Coffee Tree, *Gymnocladus canadensis*

(Fruits of C and E after Sargent.)

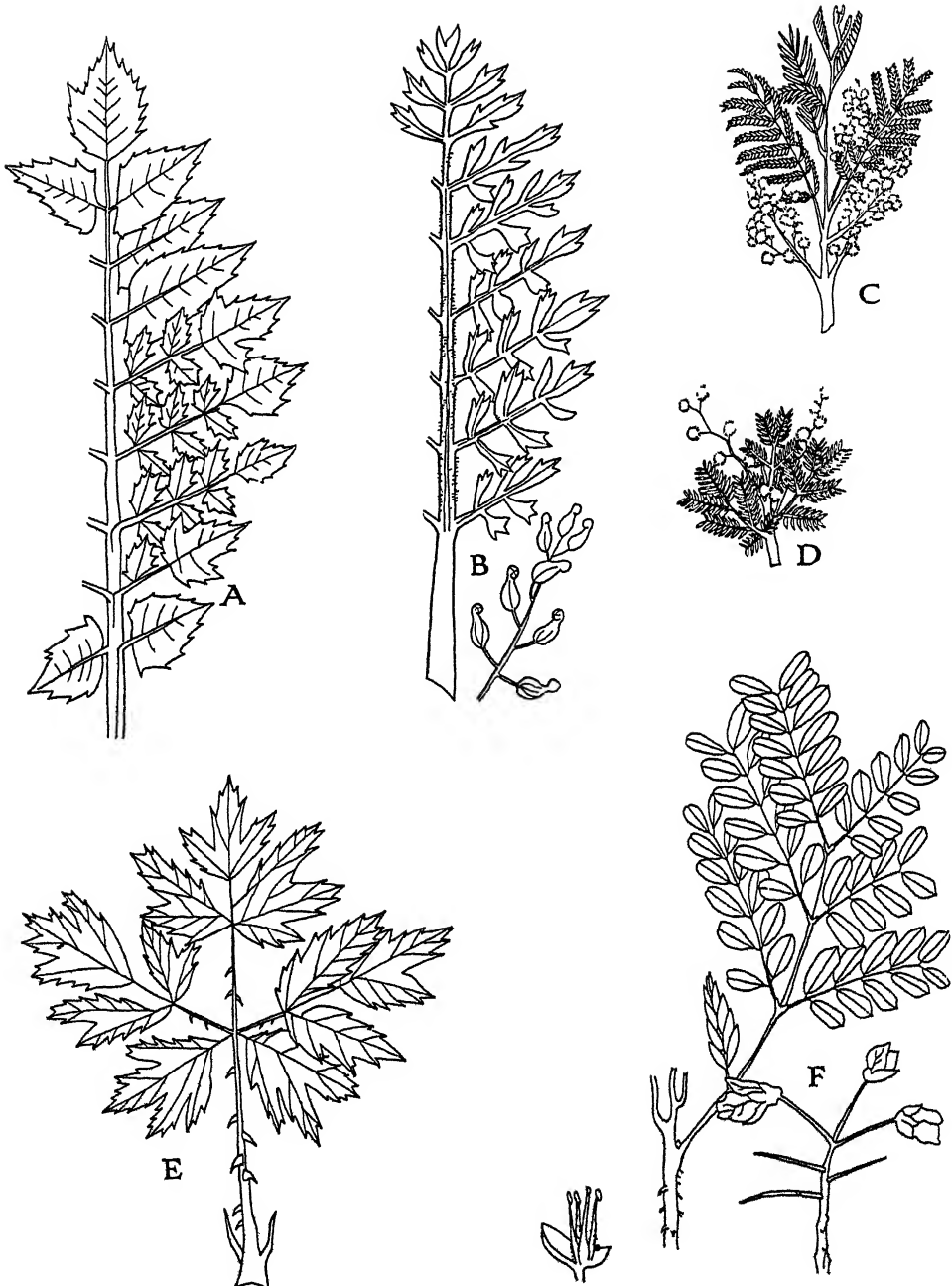


FIG. 20

A. Chilean Nut, *Guevina Avellana*
 B. *Lomatia ferruginea*
 C. Mimosa, or Silver Wattle,
Acacia dealbata

D. Bailey's Mimosa, *A. Baileyana*
 E. Cut-leaved Bramble, *Rubus*
laciniatus
 F. *Caesalpinia japonica*

(Flowers of B after *Gardener's Chronicle*.)



FIG. 21

A. Hercules' Club, or Devil's
Walking Stick, *Aralia spinosa*

B. Chinese Angelica Tree, *A.*
chinensis

C. Ditto, variety *mandschurica*

D. *Eccremocarpus scaber*

E. Bead Tree, or China Tree,
Melia Azedarach

(A after Sargent.)

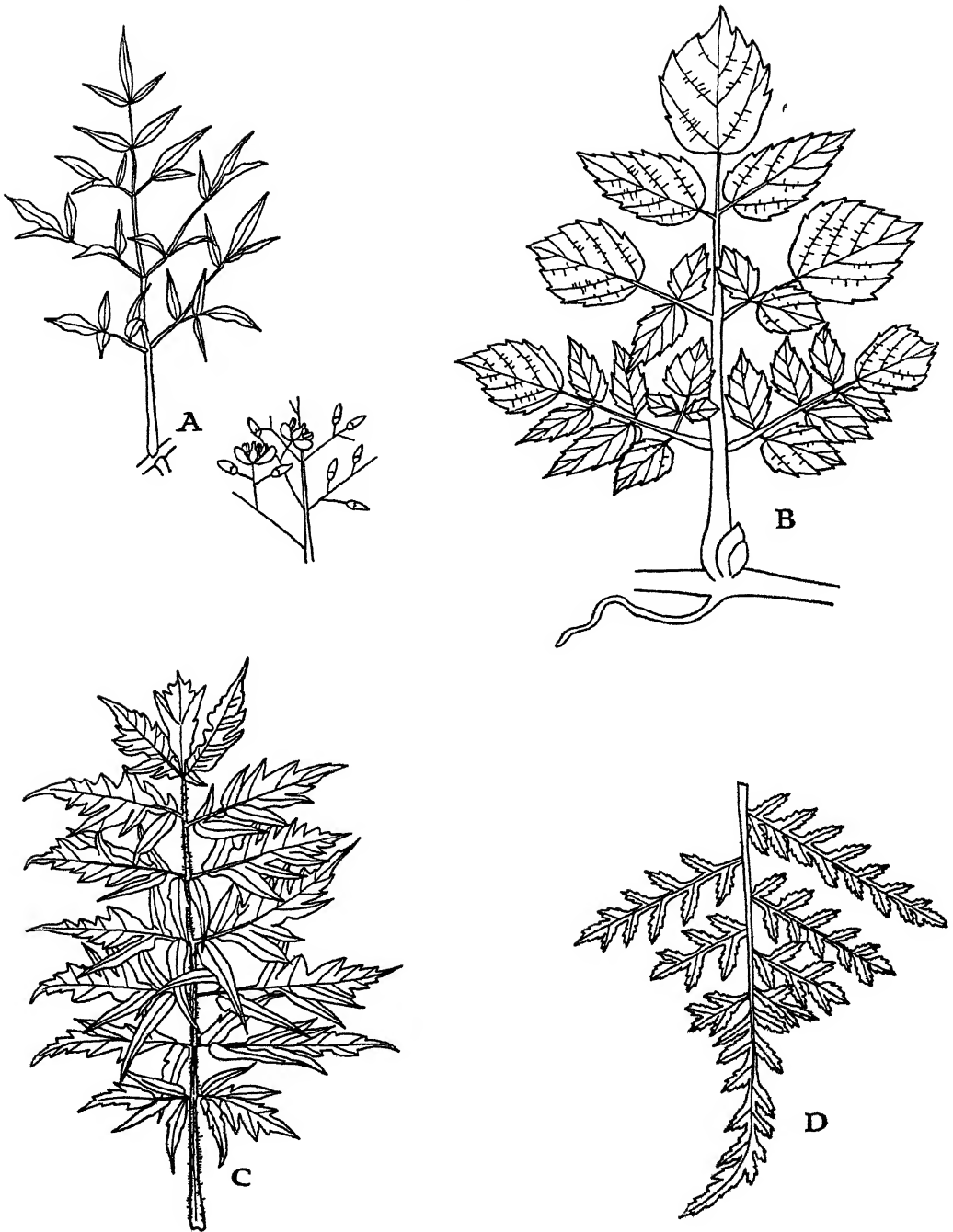


FIG. 22

A. Heavenly Bamboo, *Nandina domestica*
 B. *Vitis megalophylla*

C. Cut - leaved Sumach, *Rhus laciniata*
 D. Tree Fern, *Dicksonia antarctica*



FIG. 23

- A. Sycamore, *Acer Pseudo-platanus* D. Common Maple, *A. campestre* A. G. Montpellier Maple, *A. monspessulanum*
 B. Norway Maple, *A. platanoides* E. Hawthorn Maple, *A. crataegifolium* H. Sugar Maple, *A. saccharum*
 C. Red Maple, *A. rubrum* F. *A. rufinerve*

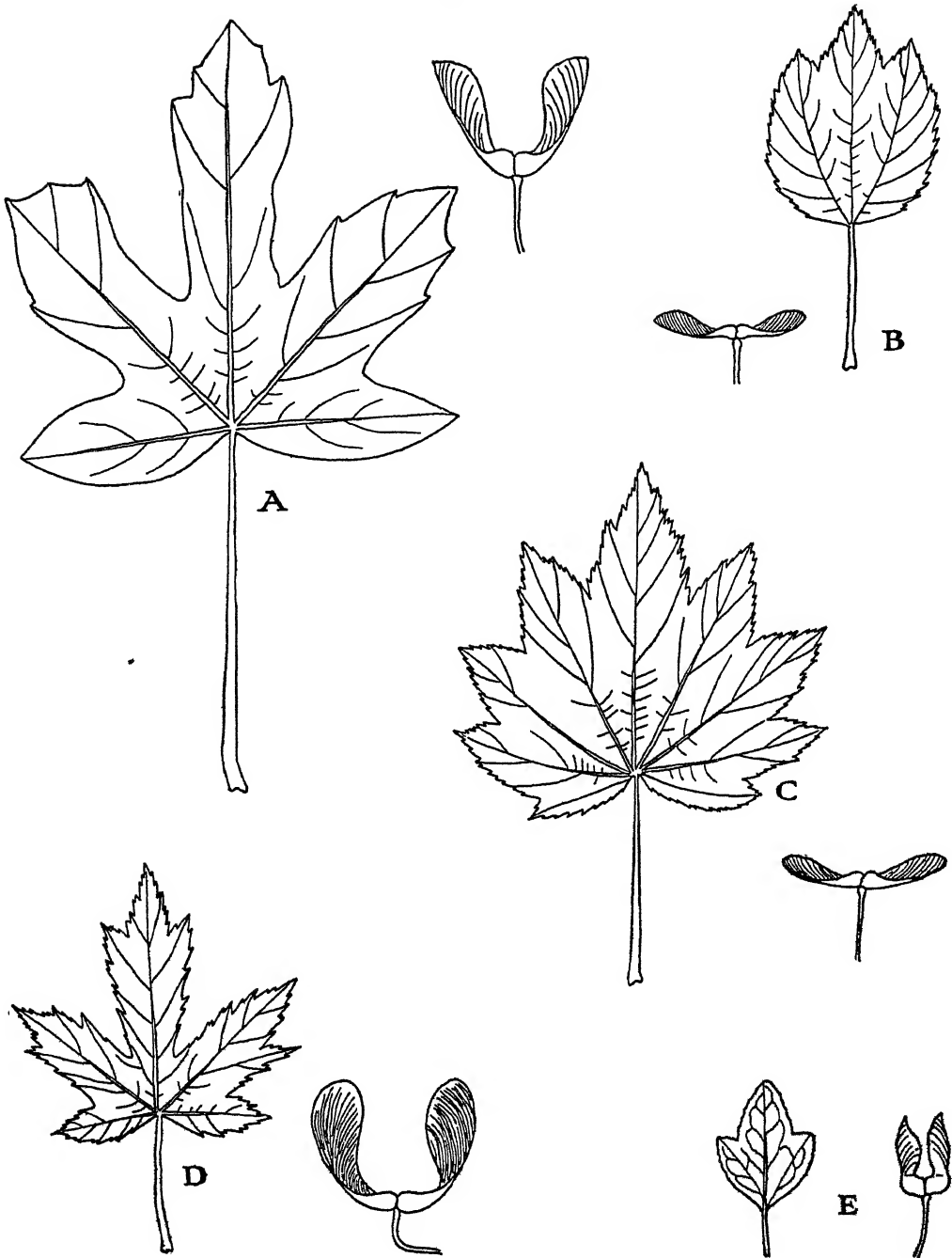


FIG. 24

A. Oregon Maple, *Acer macrophyllum*
 B. Moose Wood, or Snakebark Maple, *A. pennsylvanicum*

C. Vine Maple, *A. circinnatum*
 D. Silver Maple, *A. dasycarpum*
 E. Cretan Maple, *A. creticum*

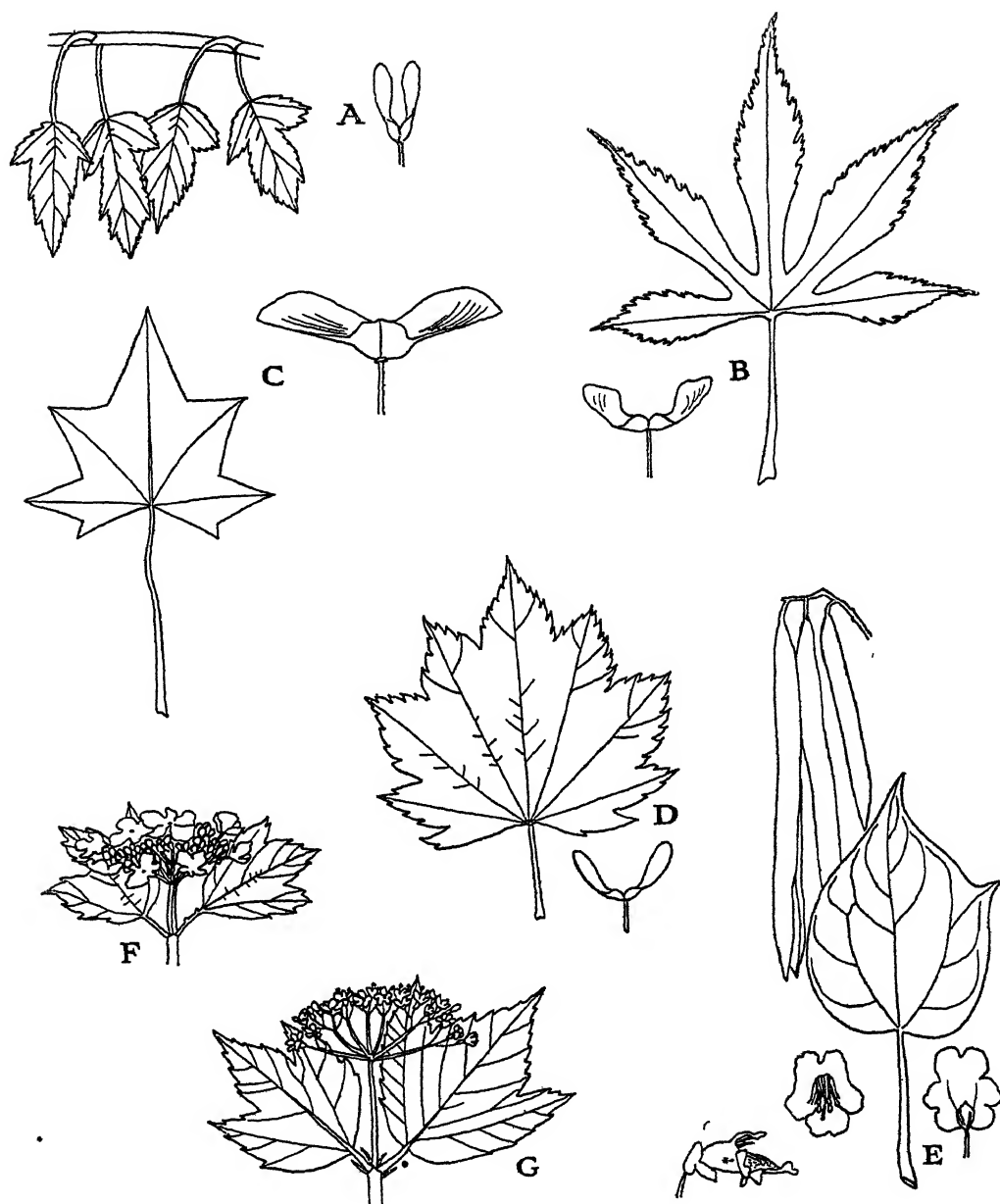


FIG. 25

A. *Acer Ginnala*C. *A. laetum*F. Guelder Rose, *Viburnum*
*Opulus*B. Japanese Maple, *A. palmatum*D. *A. japonicum*A. E. Indian Bean Tree, *Catalpa bignonioides*G. Dockmackie, *V. acerifolium*

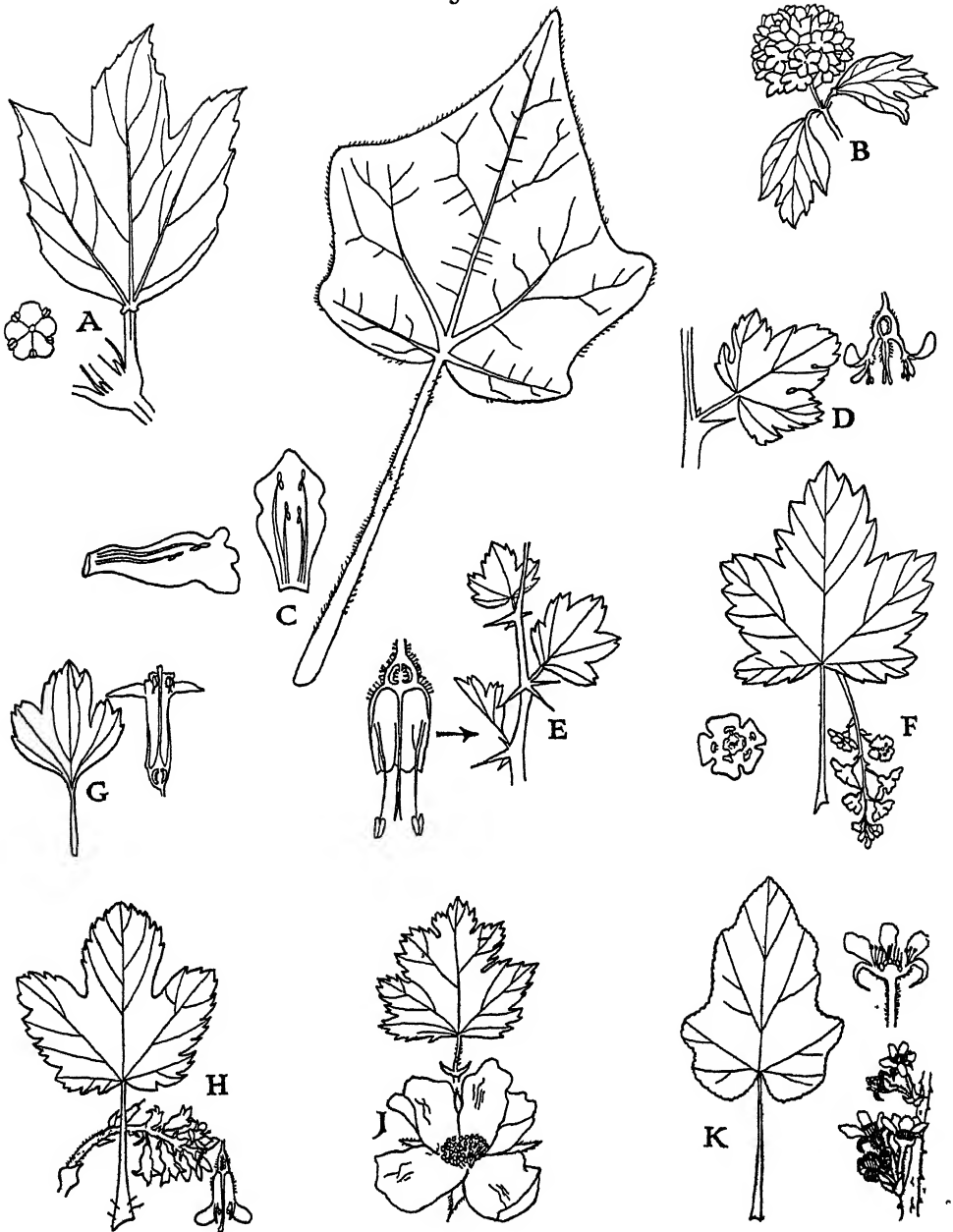


FIG. 26

A. Leaf and flower of Guelder Rose, *Viburnum Opulus*

B. Snowball Tree, *V. Opulus*, variety *sterile*

C. *Paulownia imperialis*

D. Common Gooseberry, *Ribes Grossularia*

E. Fuchsia-flowered Gooseberry, *R. speciosum*

F. Red Currant, *R. rubrum*

G. Buffalo Currant, or Golden Currant, *R. aureum*

H. Flowering Currant, *R. sanguineum*

J. Rocky Mountain Bramble, *Rubus deliciosus*

K. *R. flagelliflorus*

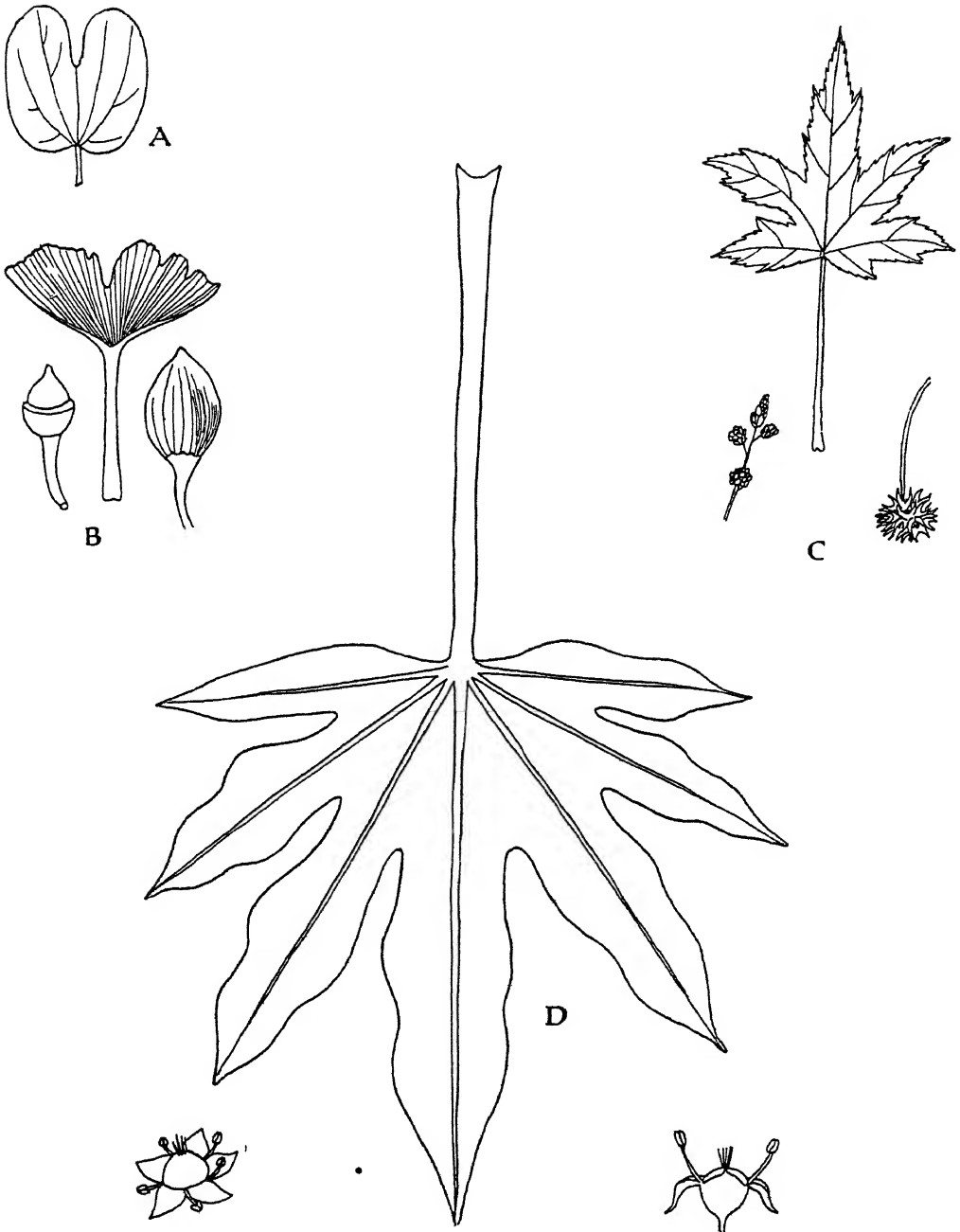


FIG. 27

A. Leaf of *Bauhinia*
 B. Maidenhair Tree, *Ginkgo biloba*

C. Sweet Gum, *Liquidambar styraciflua*
 D. *Fatsia japonica*

(Fruit of B after Veitch, flowers and fruits of C after Sargent, flowers of D after Bois.)

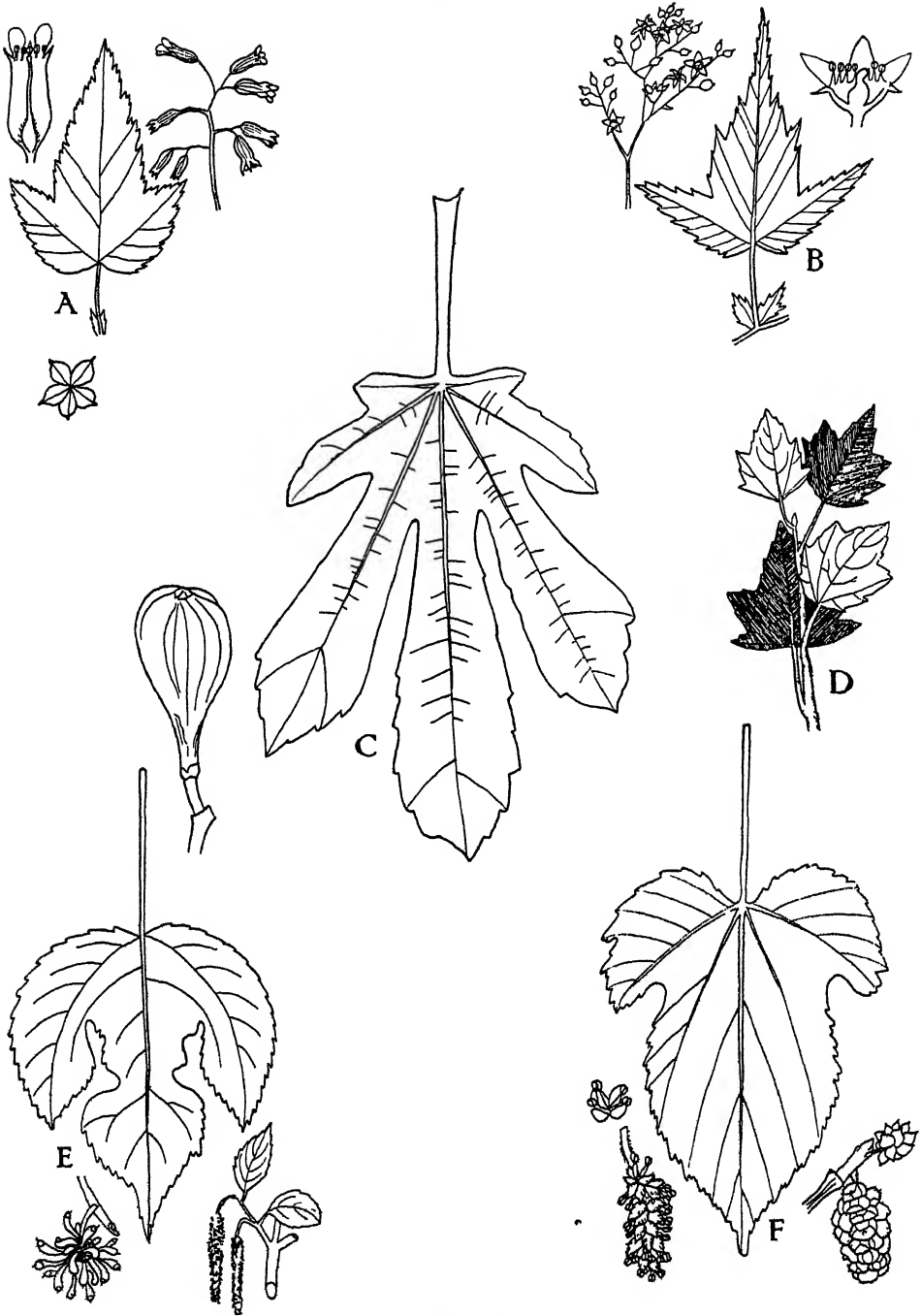


FIG. 28

A. Nine Bark, *Neillia opulifolia*

C. Common Fig, *Ficus carica*

E. Paper Mulberry, *Broussonetia papyrifera*

B. *Stephanandra Tanakae*

D. White or Silver Poplar, *Populus alba*

F. Common Mulberry, *Morus nigra*

(Flowers of E after Brandis.)

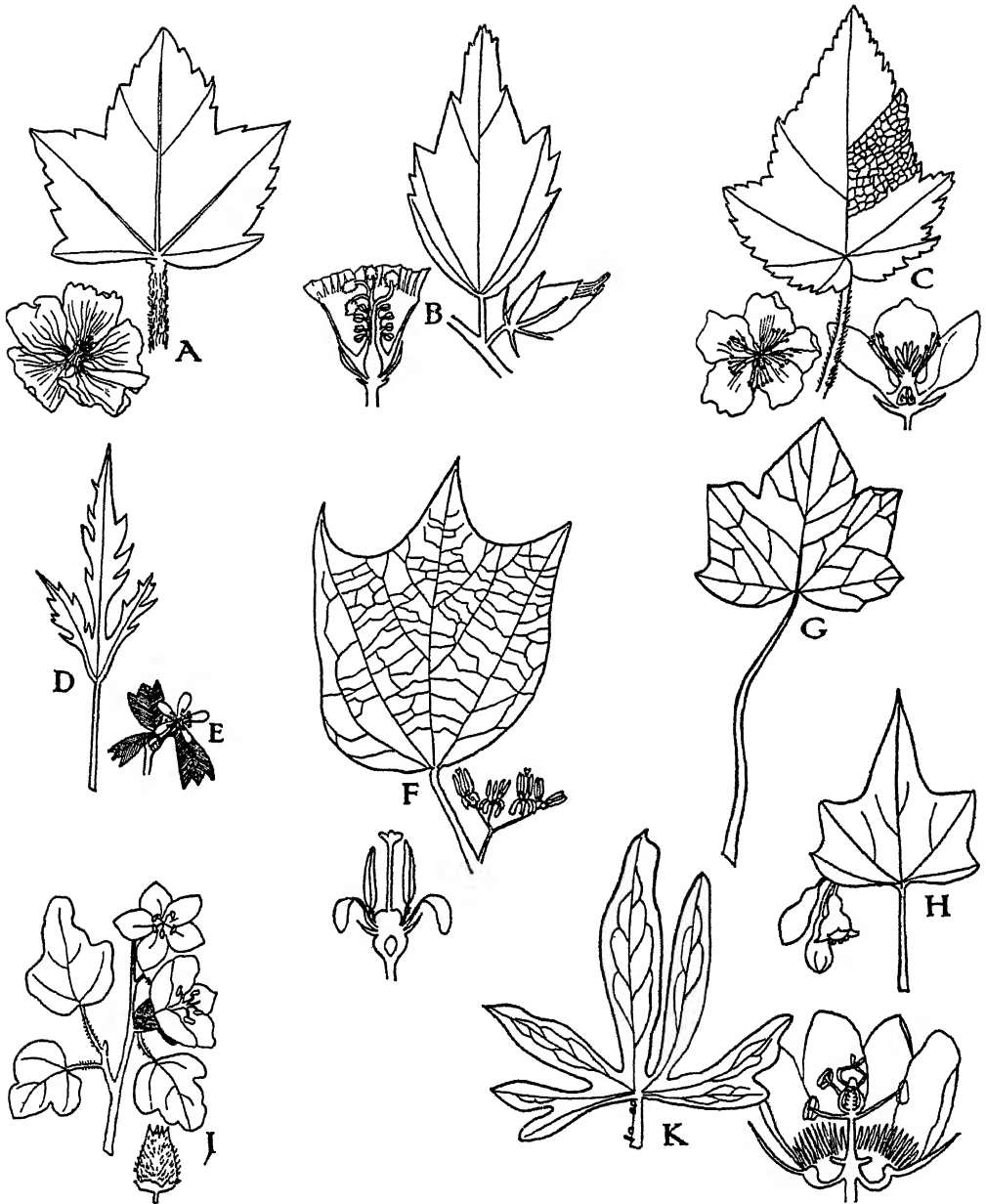


FIG. 29

- A Tree Mallow, *Lavatera arborea* D. Cut-leaved Lime, *Tilia asplenifolia* H. Flame Tree, *Brachychiton acerifolium*
 B. Shrubby Althaea, *Hibiscus syriacus* E. *Purshia tridentata* J. *Fremontia californica*
 C *Abutilon vitifolium* F. *Alangium chinense* K. Passion Flower, *Passiflora coerulea*
 G Leaf of Ivy, *Hedera Helix* (see Fig. 120 B)

(Flowers of H after *Botanical Magazine*, of K after Bois.)

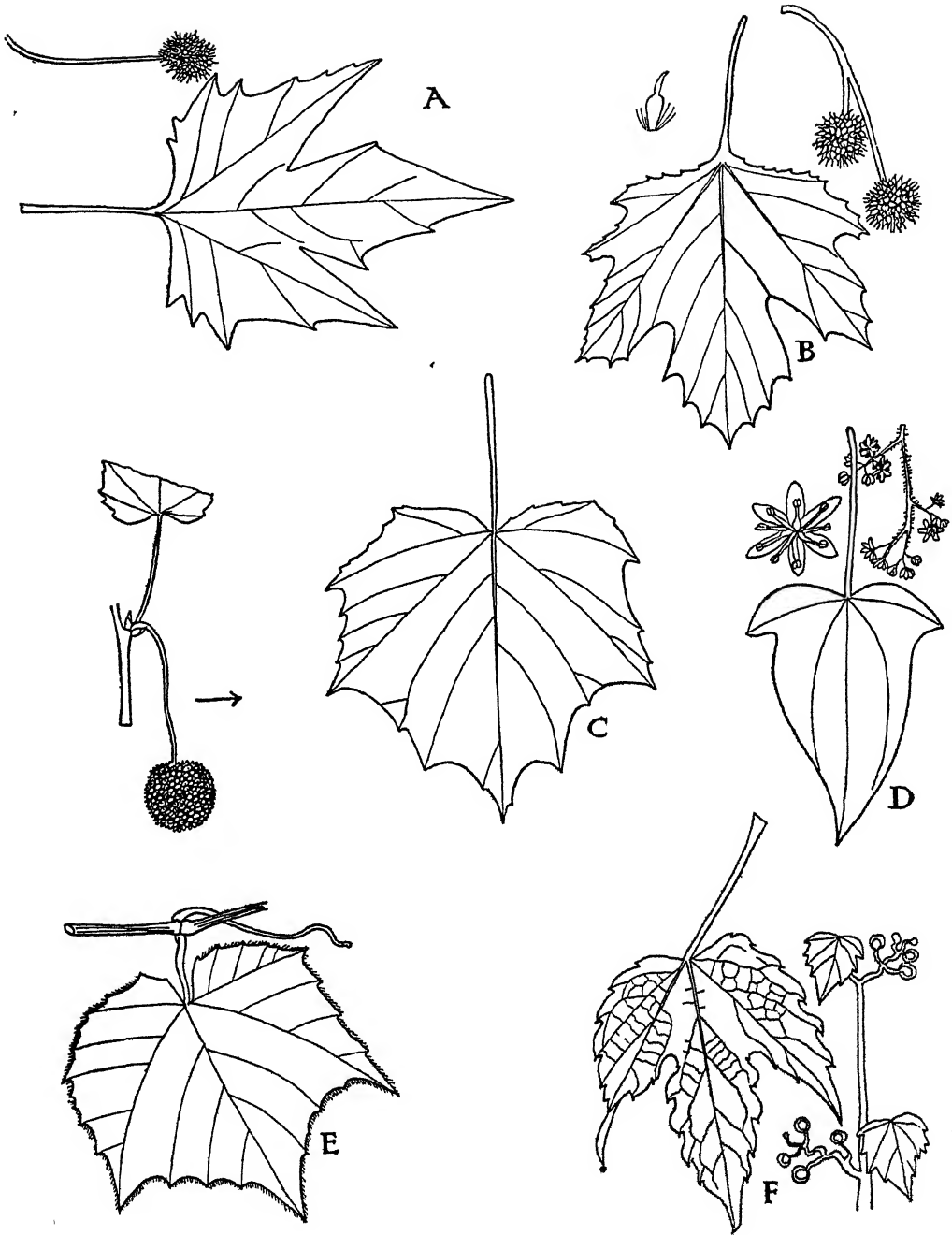


FIG. 30

A. Oriental Plane, *Platanus orientalis*
 B. London Plane, *P. acerifolia*
 C. Button Wood, *P. occidentalis*

D. *Sinomenium acutum*
 E. *Vitis Coignetiae*
 F. *V. inconstans* (*Ampelopsis Veitchii*)

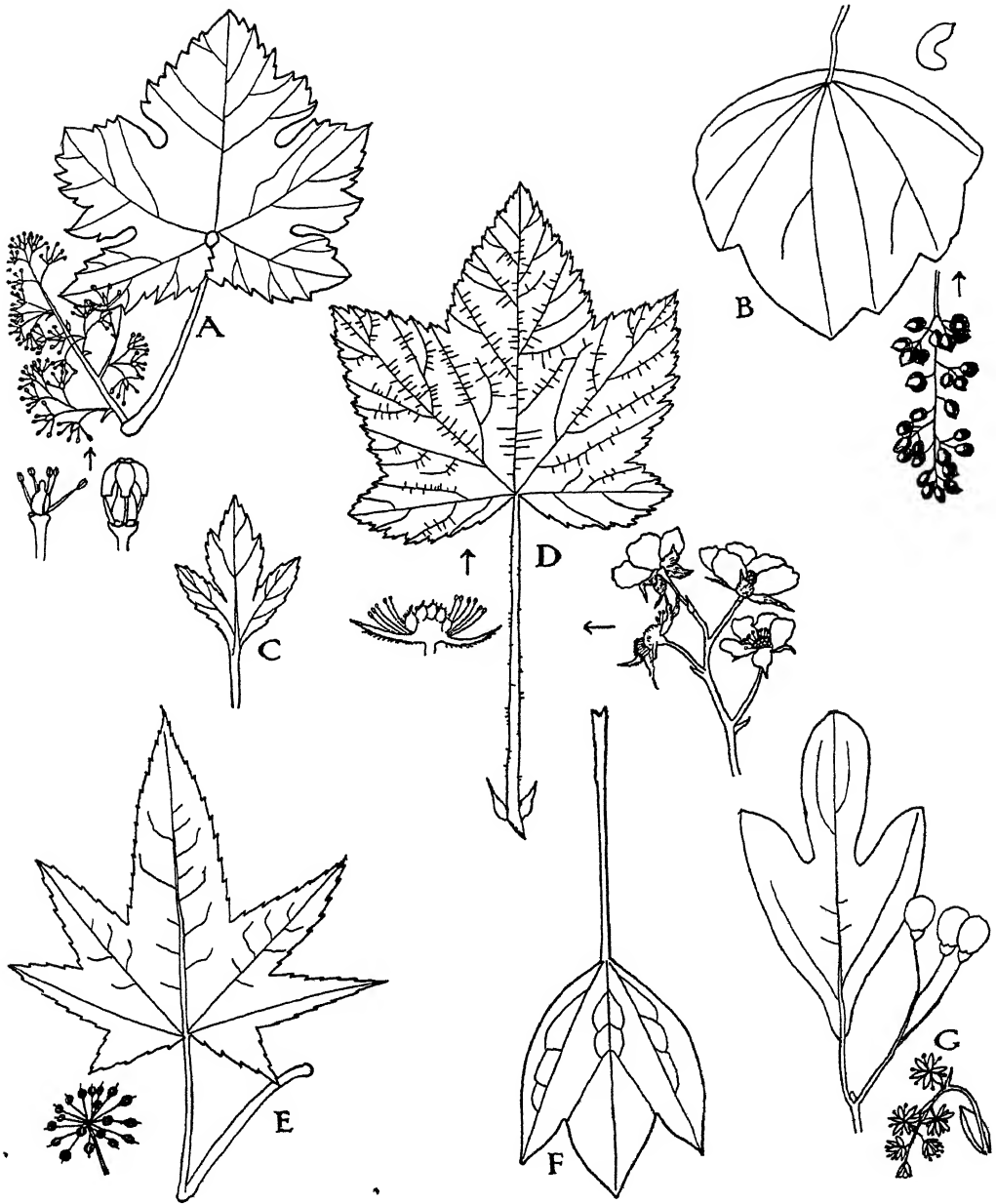


FIG. 31

- A. Grape Vine, *Vitis vinifera* D. Salmon Berry, *Rubus parviflorus* G. Ague Tree, *Sassafras officinale*
 B. Moonseed, *Menispermum canadense* E. *Acanthopanax ricinifolium* (Genus not figured *Echino-panax*)
 C. Leaf of *Malus toringoides* F. *Dendropanax japonicum*
- (Fruits of B after Le Maout and Decaisne.)

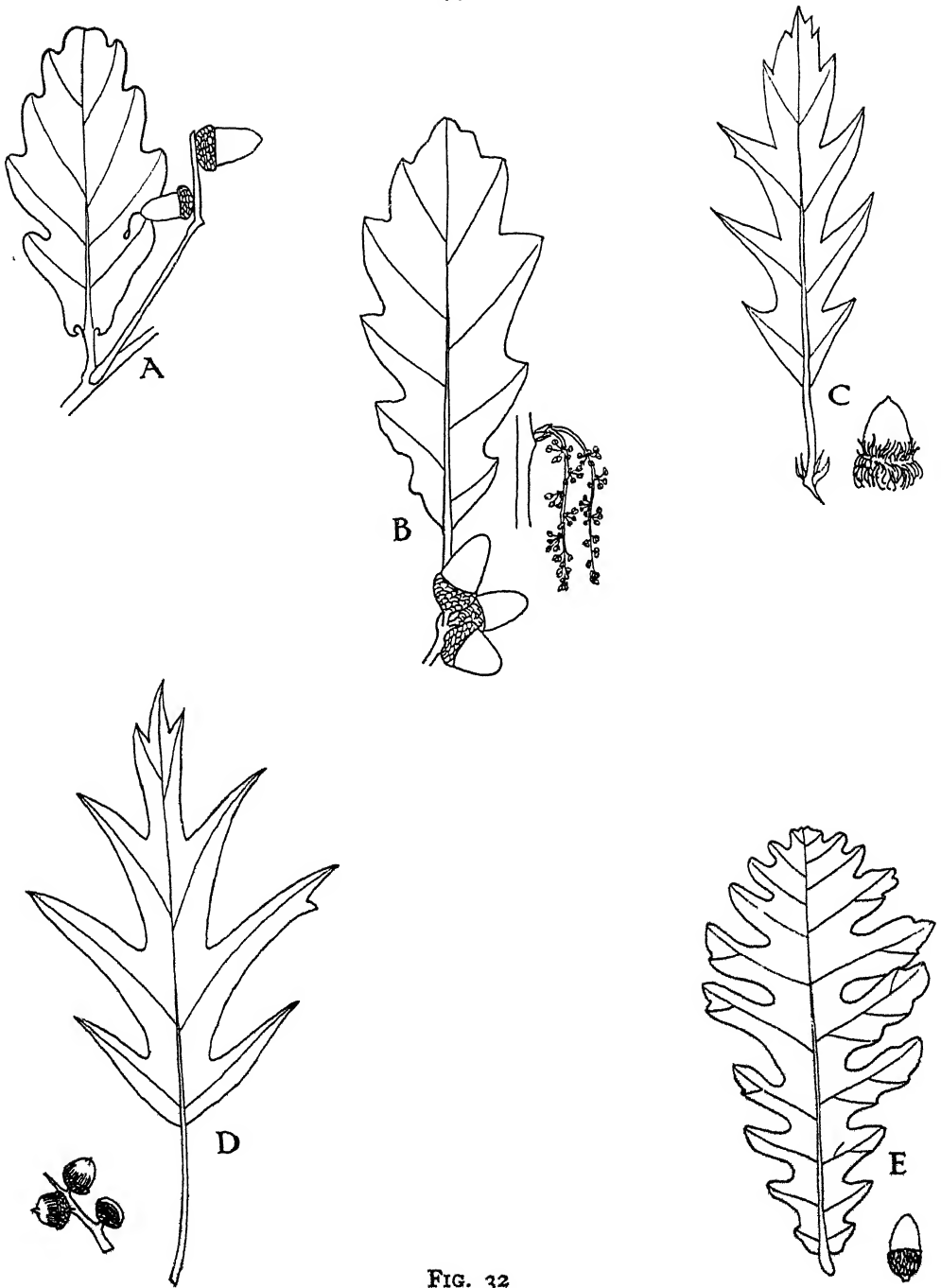


FIG. 32

- A. Common English Oak, *Quercus pedunculata*
 B. Durmast Oak, or Sessile Oak, *Q. sessiliflora*
 C. Turkey Oak, *Q. Cerris*
 D. Red Oak, *Q. rubra*
 E. Hungarian Oak, *Q. conferta*

(D after Sargent.)

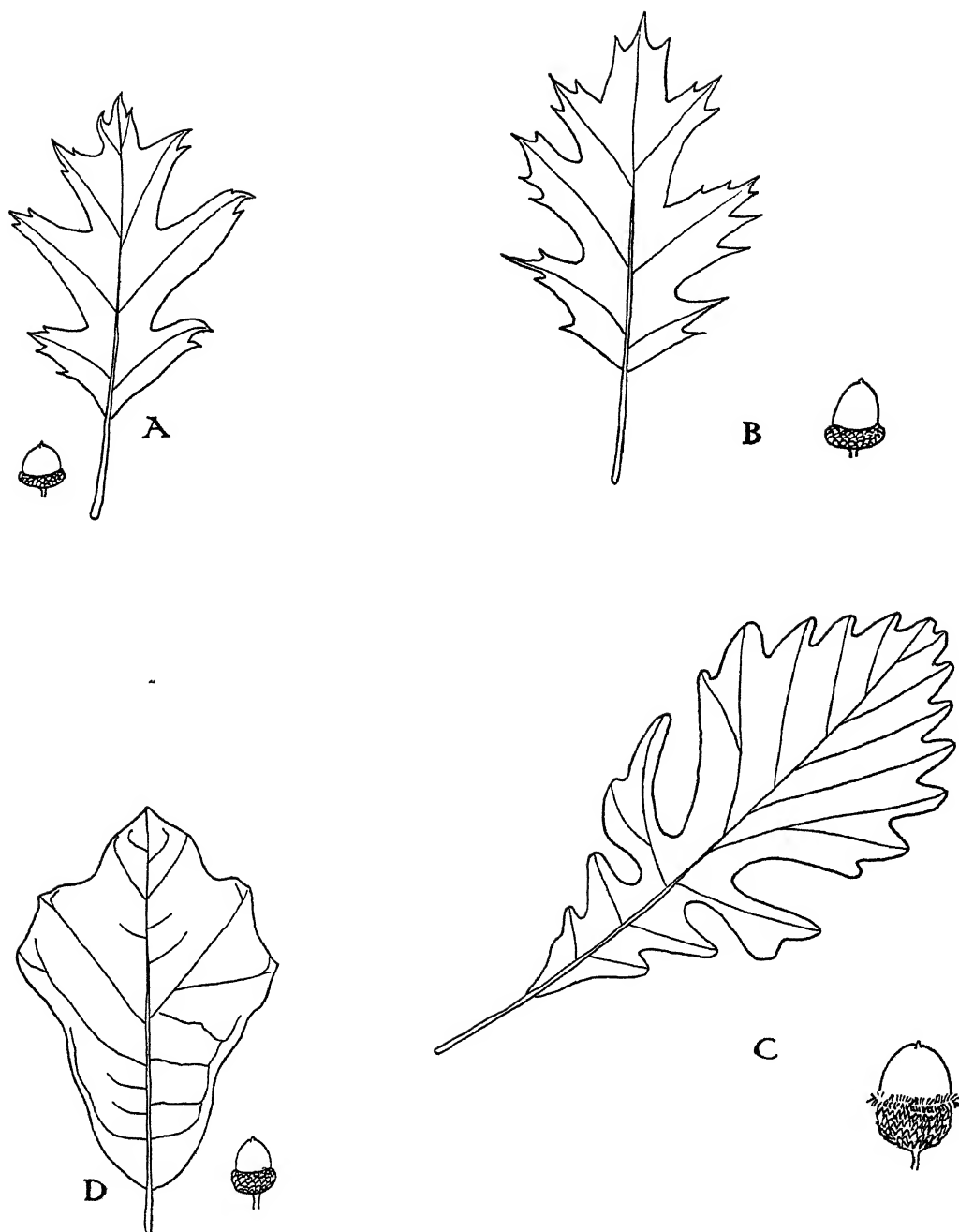


FIG. 33

- A. Pin Oak, *Quercus palustris* B. Scarlet Oak, *Q. coccinea* D. Black Jack, *Q. marilandica*
 C. Burr Oak, *Q. macrocarpa*
- (All after Sargent.)

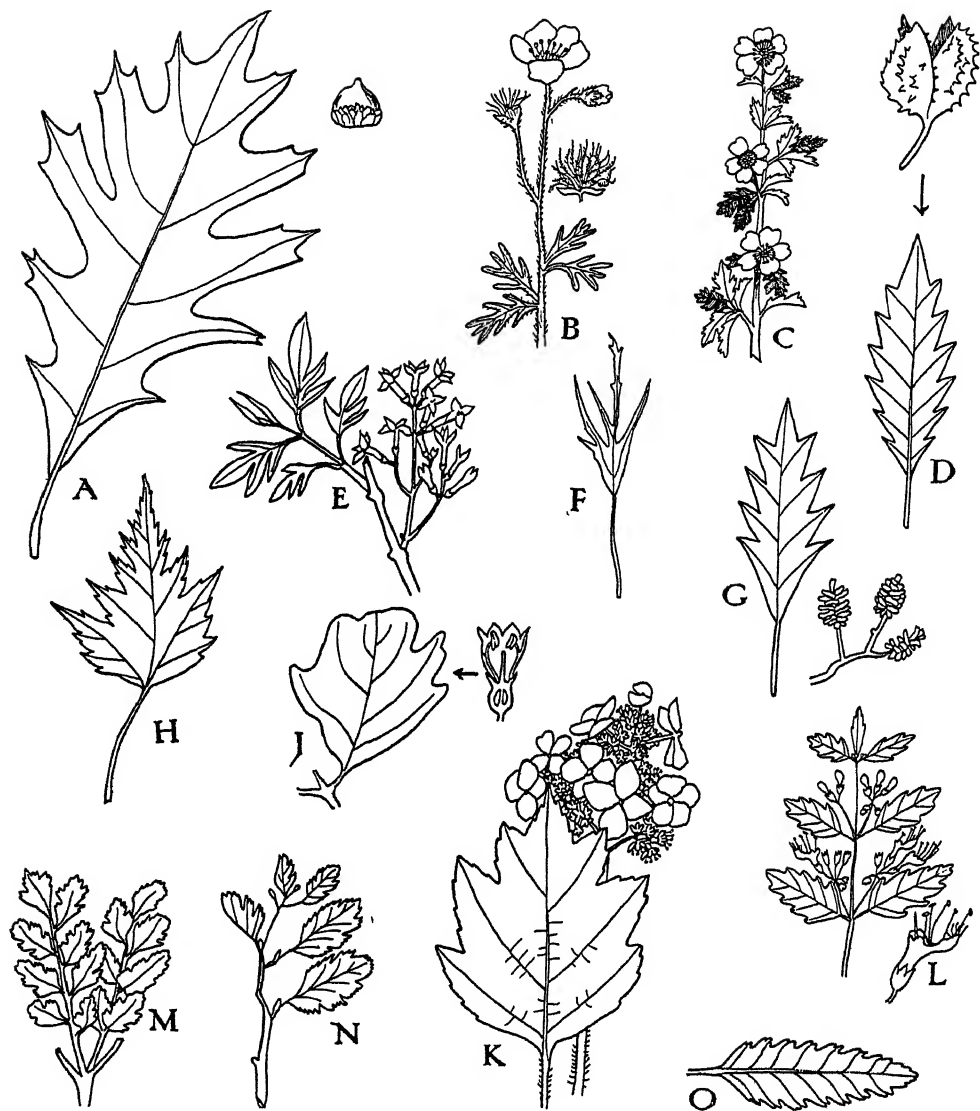


FIG. 34

- A. Black Oak, *Quercus velutina*
 B. *Fallugia paradoxa*
 C. *Cowania mexicana*
 D. Fern-leaved Beech, *Fagus sylvatica*, variety *heterophylla*
 E. Cut-leaved variety of Persian Lilac, *Syringa persica*
 F. Cut-leaved variety (*imperialis*) of Common Alder, *Alnus glutinosa*
 G. Ditto (*laciniata*)
 H. Swedish Birch, *Betula verrucosa*, variety *laciniata*
 I. Snowberry, *Symphoricarpos racemosus*
 K. Grey Beard, *Hydrangea quercifolia*
 L. *Caryopteris tangutica*
 M. *Phyllocladus trichomanoides*
 N. Antarctic Beech, *Nothofagus antarctica*
 O. Roblé Beech, *N. obliqua*

(A after Sargent, C after Loudon, M after Dallimore and Jackson.)



FIG 35

- A. *Crataegus punctata* D. Parsley-leaved Thorn, *C. apifolia* H. Tansy-leaved Thorn, *C. tanacetifolia*
 B. Common Hawthorn or Quick, *C. monogyna* E. Scarlet Haw, *C. coccinea* J. Azarole, *C. Azarolus*
 C. May, *C. oxyacanthoides* F. Hungarian Thorn, *C. nigra* K. Washington Thorn, *C. cordata*
 G. Red Haw, *C. mollis*

(D and F after Loudon, K after Sargent)



FIG. 36

A. Lavender Cotton, *Santolina Chamaecyparissus*

B. Wormwood, *Artemisia Absinthum*

C. Southernwood, or Lad's Love, *A. Abrotanum*

D. Tulip Tree, *Liriodendron Tulipifera*

E. *Romneya Coulteri*

F. Common Rue, *Ruta graveolens*

G. Sweet Fern, *Myrica (Comptonia) asplenifolia*

H. Leaf of *Spiraea discolor* (flowers similar to Fig. 12 J)

J. Hawthorn-leaved Crab Apple, *Malus florentina*

K. Wild Service, *Sorbus Torminalis*

L. Bastard Service, *S. hybrida*

M. *Pittosporum divaricatum*

(Flower of F after Kerner and Oliver.)

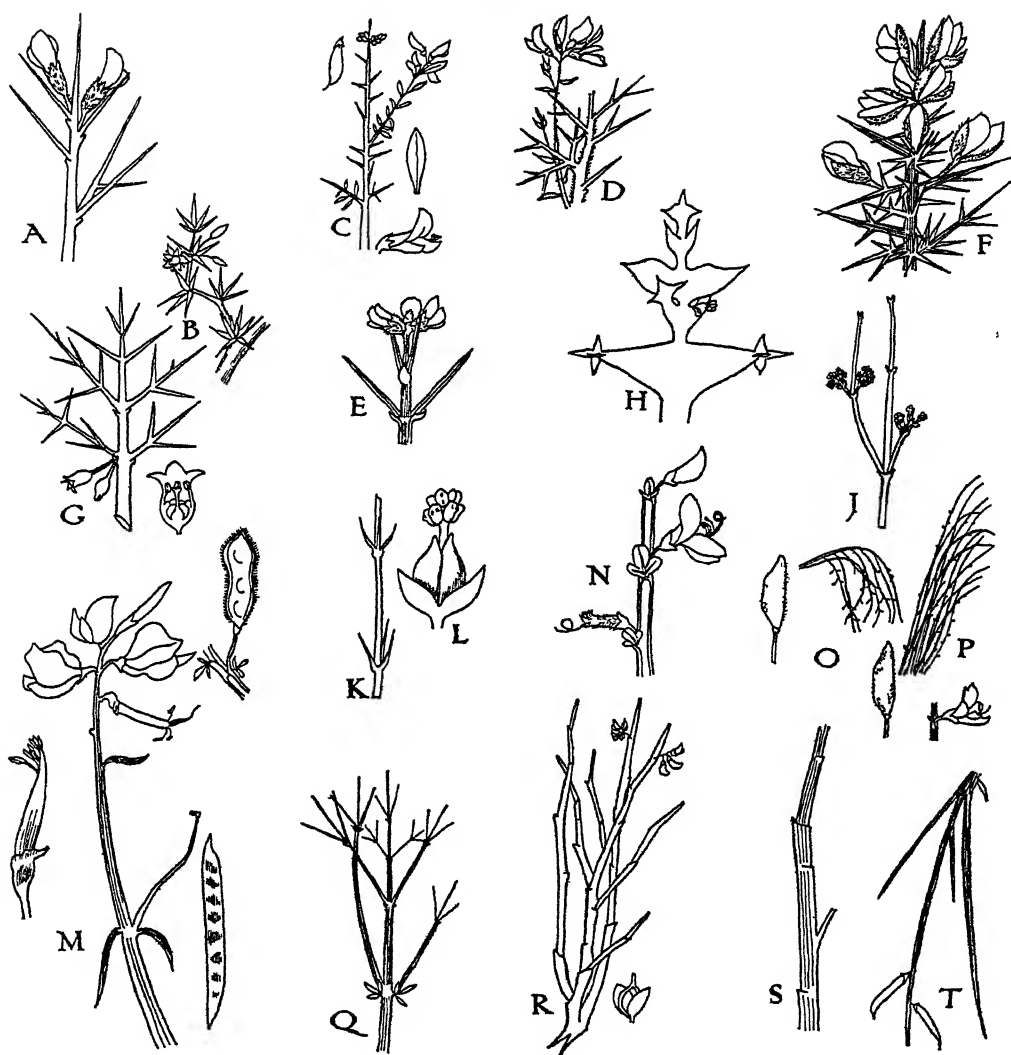


FIG. 37

A. Hedgehog Broom, *Erinacea pungens*

B. *Asparagus aphyllus*

C. Needle Furze, or Petty Whin, *Genista anglica*

D. Spanish Gorse, *G. hispanica*

E. *G. horrida*

F. Gorse, Furze, or Whin, *Ulex europaeus*

G. *Colletia armata*

H. *Colletia cruciata*

J. Shrubby Horsetail, *Ephedra distachya*

K. *E. trifurca*

L. Male flower of *Ephedra*

M. Yellow Spanish Broom, *Spartium junceum*

N. Common Broom, *Cytisus scoparius*

O. Diagrammatic representation of Warminster Broom, *C. praecox*

(L after Le Maout and Decaisne.)

P. Ditto of White Spanish Broom, *C. albus*

Q. *Genista radiata*

R. Lilac Broom, *Carmichaelia australis*

S. Pink Broom, *Notospartium Carmichaeliae*

T. Etna Broom, *Genista aetnensis*

(Genus not figured: *Chordospartium*)

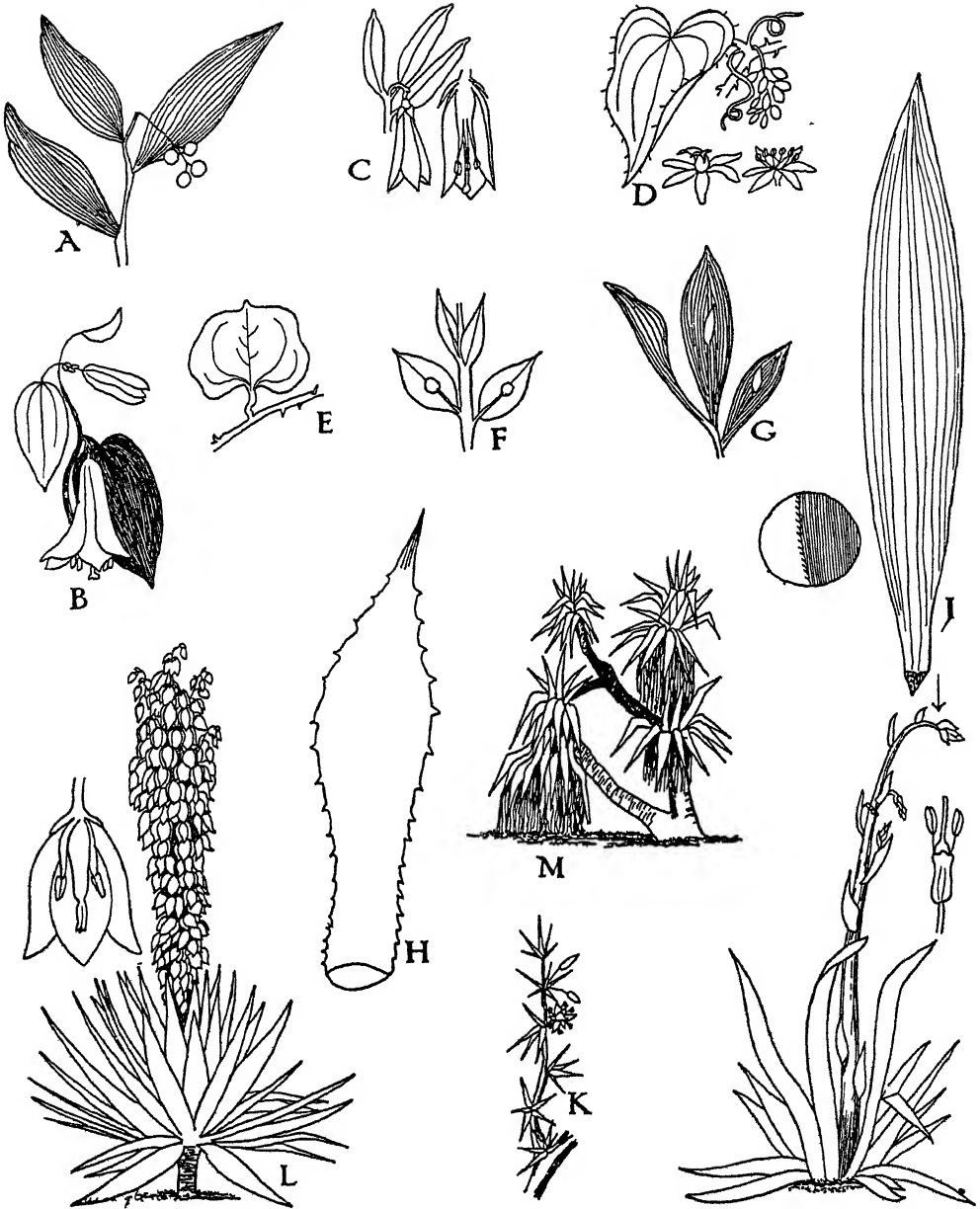


FIG. 38

A. Alexandrian Laurel,
Danaea racemosa

B. Chilean Bell Flower,
Lapageria rosea

C. Pepino, *Philesia buxifolia*

D. Rough Bindweed, *Smilax aspera*

E. Horse Brier, *S. rotundifolia*

F. Butcher's Broom, *Ruscus aculeatus*

G. *R. hypoglossum*

H. Leaf of *Agave*

J. *Beschorneria yuccoides*

K. *Asparagus aphyllus*

L. Adam's Needle, *Yucca gloriosa*

M. *Y. recurvifolia*

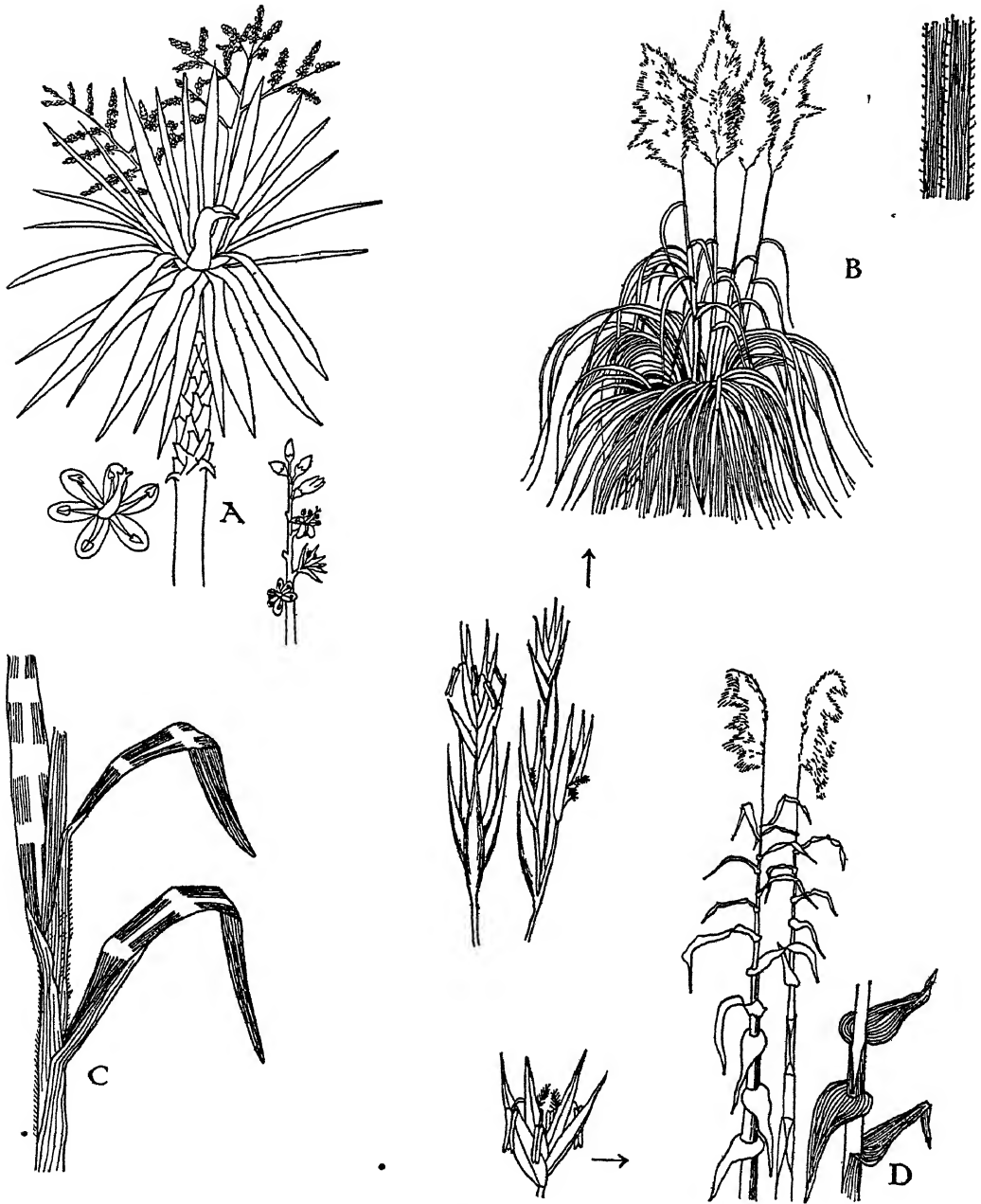


FIG. 39

- A. Club Palm, or Cabbage Tree,
Cordyline (Dracaena) australis
B. Pampas Grass, *Cortaderia (Gyn-
erium) argentea*

C. *Miscanthus (Eulalia) japonicus*,
variety *zebrina*

D. Great Reed, *Arundo Donax*

(Flowers of B after Le Maout and Decaisne, of D after Wettstein)

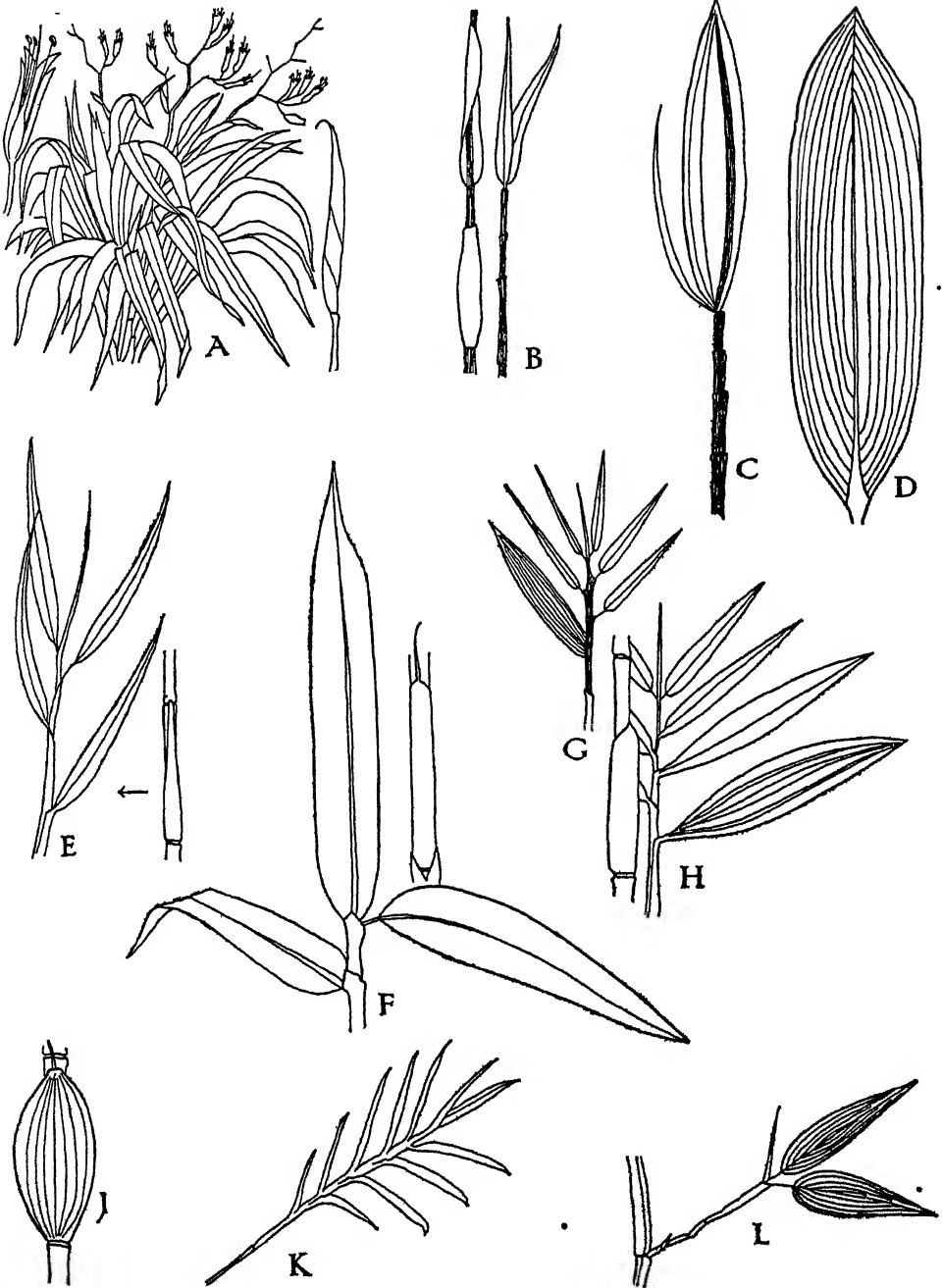


FIG. 40

A. Mountain Flax, *Phoridium Colensoi*

Hardy Bamboos
B. *Arundinaria anceps*

C. *A. auricoma*
D. *A. palmata*
E. *A. falcata*
F. *A. japonica*
G. *A. nitida*

H. *A. graminea*

I. *A. fastuosa*

K. *Bambusa disticha*

L. *Phyllostachys*

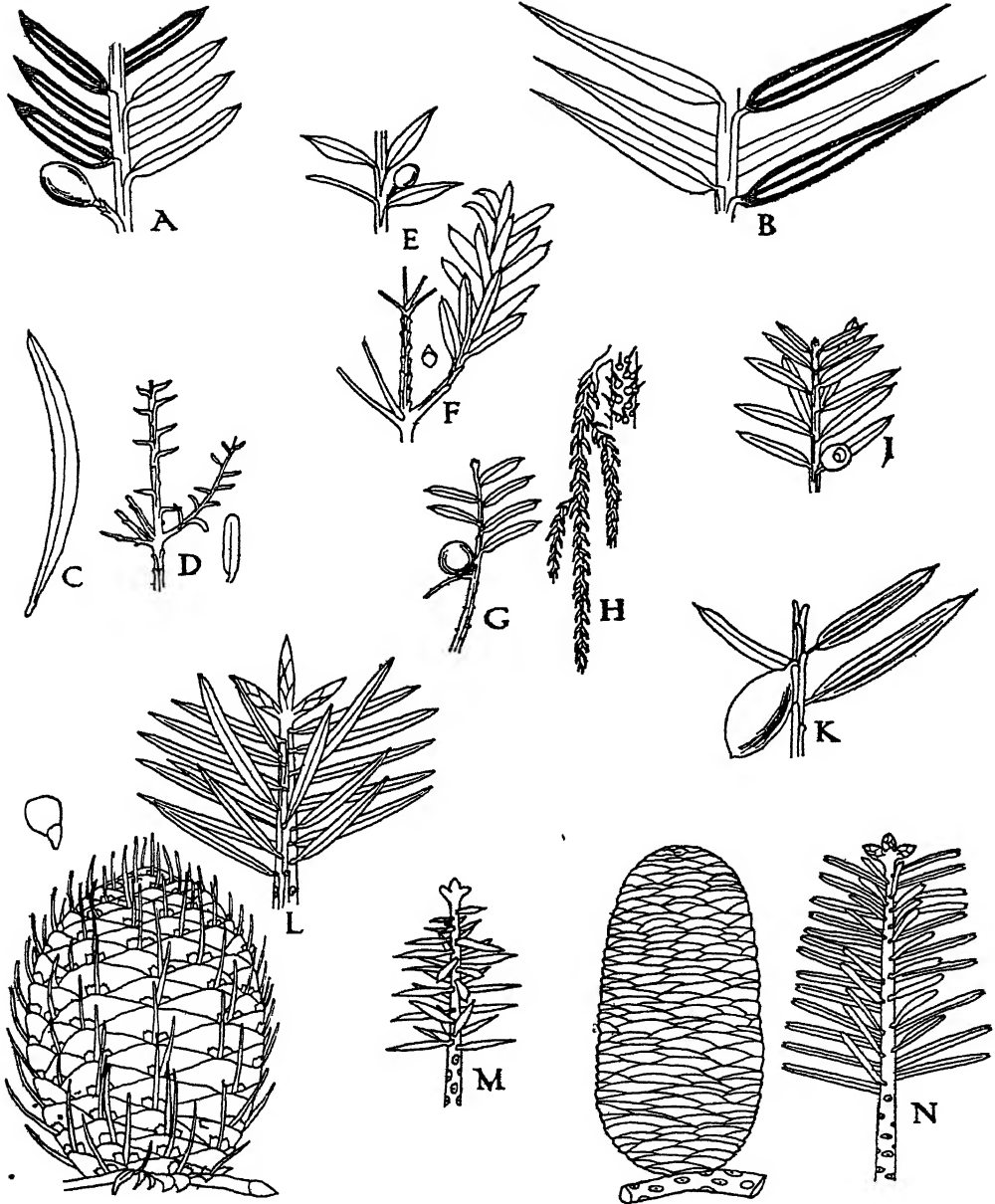


FIG 41

- | | | |
|--|--|--|
| A. Cow's Tail Pine, <i>Cephalotaxus drupacea</i> | F. Prince Albert's Yew, <i>Saxegothaea conspicua</i> | J. Common Yew, <i>Taxus baccata</i> |
| B. <i>C. Fortunei</i> | G. Plum-fruited Yew, <i>Prumnopitys elegans</i> | K. <i>Torreya nucifera</i> |
| C. Leaf of <i>Podocarpus chinensis</i> | H. Huon Pine, <i>Dacrydium cupressinum</i> | L. Santa Lucia Fir, <i>Abies bracteata</i> |
| D. <i>P. alpina</i> | | M. Spanish Fir, <i>A. pinsapo</i> |
| E. <i>P. Totara</i> | | N. Giant Fir, <i>A. grandis</i> |



FIG. 42

A. Common Silver Fir, *Abies pectinata*

B. Balsam Fir, *A. balsamea*

C. Nikko Fir, *A. brachyphylla*

D. Momi Fir, *A. firma*

E. Caucasian Fir, *A. Nordmanniana*

F. Himalayan Fir, *A. Webberiana*

G. *A. amabilis*

H. *A. Veitchii*

J. Korean Fir, *A. koreana*

K. Noble Fir, *A. nobilis*

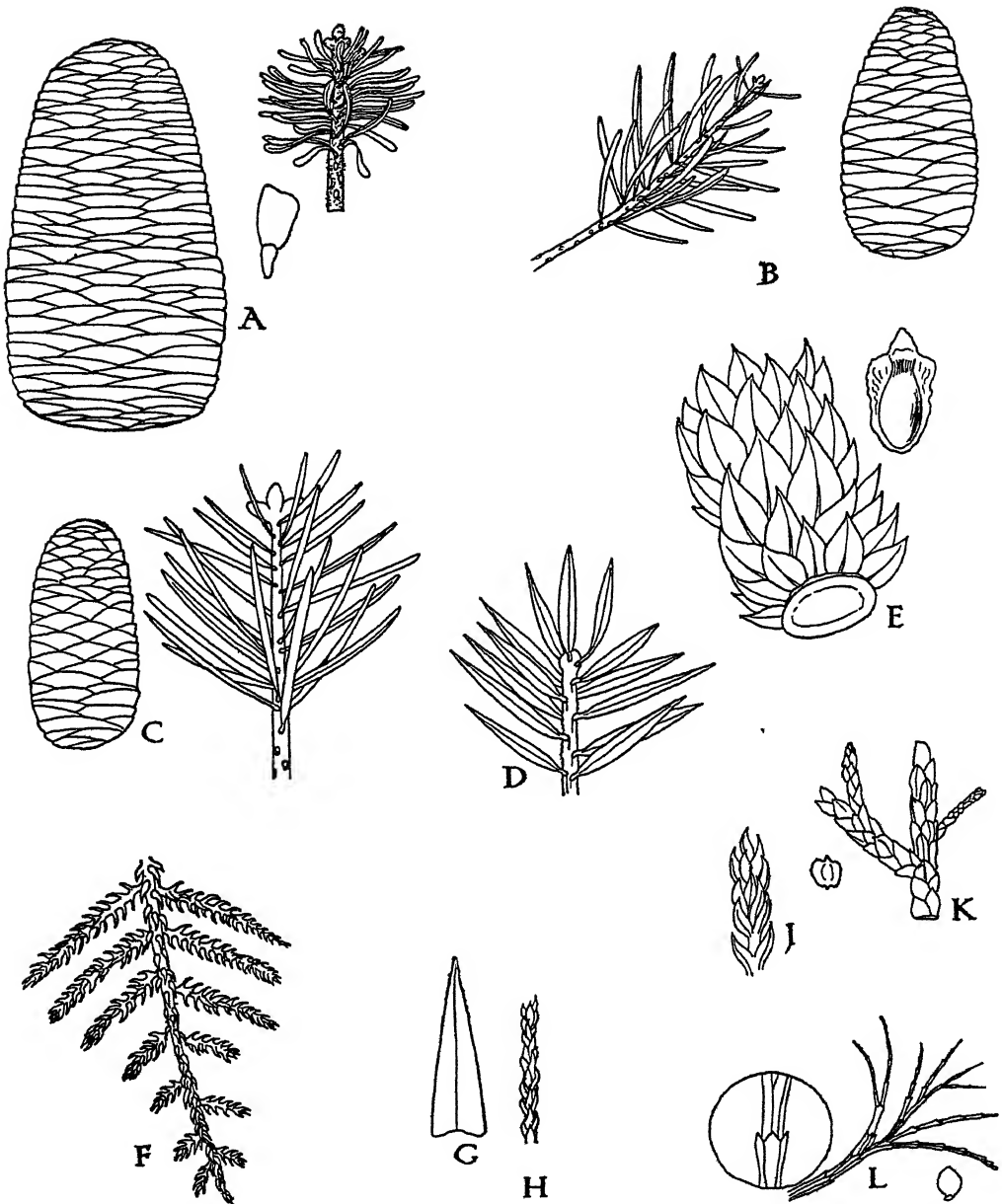


FIG. 43

- A Red Fir, *Abies magnifica* E. Chile Pine, or Monkey Puzzle, *Araucaria imbricata* H. Tasmanian Cedar, *Athrotaxis laxifolia*
 B. Rocky Mountain Fir, *A. lasiocarpa* F. Norfolk Island Pine, *A. excelsa* J. King William Pine, *A. selaginoides*
 C. Colorado Fir, *A. concolor* G. Diagram of an awl-shaped leaf K. *A. cupressoides*
 D. *Keteleeria Davidiana* L. Cypress Pine, *Callitris oblonga*

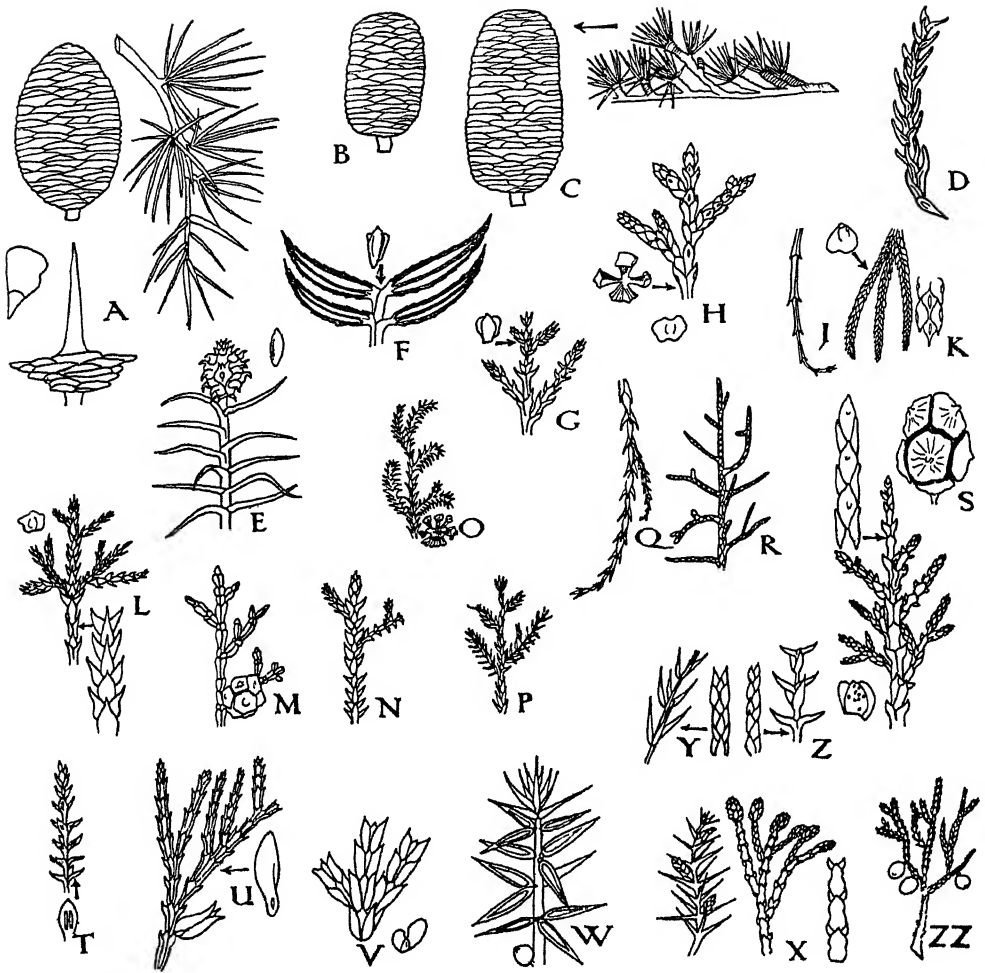


FIG. 44

- A. Himalayan Cedar, or Deodar, *Cedrus Deodara*
 B. Cone of Atlas Cedar, *C. atlantica*
 C. Cedar of Lebanon, *C. Libani*
 D. Japanese Cedar, *Cryptomeria japonica*
 E. Japanese Cedar, variety *elegans*
 F. *Cunninghamia sinensis*
 G. Formosan Cypress, *Cupressus formosensis*
 H. Lawson's Cypress, *C. Lawsoniana*
 J. Lawson's Cypress, variety *filifera*
 K. Chinese Weeping Cypress, *C. funebris*
 L. Nootka Cypress, *C. nootkatensis*
 M. Hinoki Cypress, *C. (Retinospora) obtusa*
 N. Sawara Cypress, *C. (Retinospora) pisifera*
 O. Sawara Cypress, variety *plumosa* (*Retinospora plumosa*)
 P. Sawara Cypress, variety *squarrosa* (*Retinospora squarrosa*)
 Q. Sawara Cypress, variety *filifera*
 R. Arizona Cypress, *C. arizonica*
 S. Monterey Cypress, *C. macrocarpa*
 T. *Fitzroya patagonica*
 U. Incense Cedar, *Libocedrus decurrens*
 V. *Fokienia Hodginsii*
 W. Common Juniper, *Juniperus communis*
 X. Chinese Juniper, *J. chinensis*
 Y. Himalayan Juniper, *J. recurva*
 Z. Red or Pencil Cedar, *J. virginiana*
 ZZ. Savin, *J. Sabina*

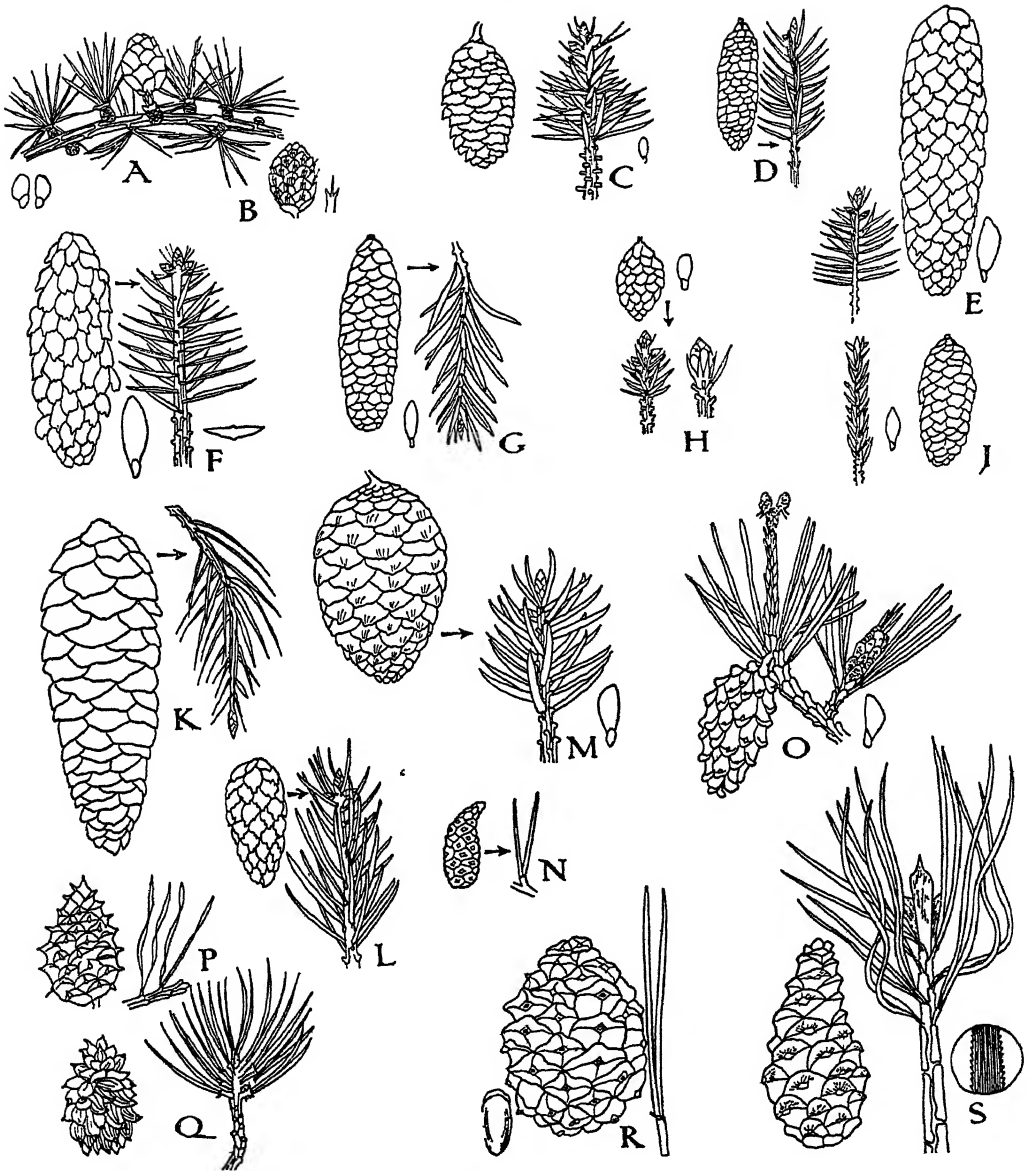


FIG. 45

- | | | |
|---|---|---------------------------------------|
| A. Common Larch, <i>Larix europaea</i> | F. Sitka Spruce, <i>P. sitkensis</i> | M Tiger-tail Spruce, <i>P. polita</i> |
| B. Cone of <i>Larix occidentalis</i> | G. Weeping Spruce, <i>P. Breweriana</i> | N Jack Pine, <i>Pinus Banksiana</i> |
| C. Servian Spruce, <i>Picea Omorika</i> | H. Black Spruce, <i>P. nigra</i> | O. Scots Pine, <i>P. sylvestris</i> |
| D White Spruce, <i>P. alba</i> | J. <i>P. orientalis</i> | P Beach Pine, <i>P. contorta</i> |
| E. Common or Norway Spruce, <i>P. excelsa</i> | K. Himalayan Spruce, <i>P. Morinda</i> | Q Mountain Pine, <i>P. montana</i> |
| | L. <i>P. Engelmannii</i> | R. Stone Pine, <i>P. Pinea</i> |
| | | S. Corsican Pine, <i>P. Laricio</i> |

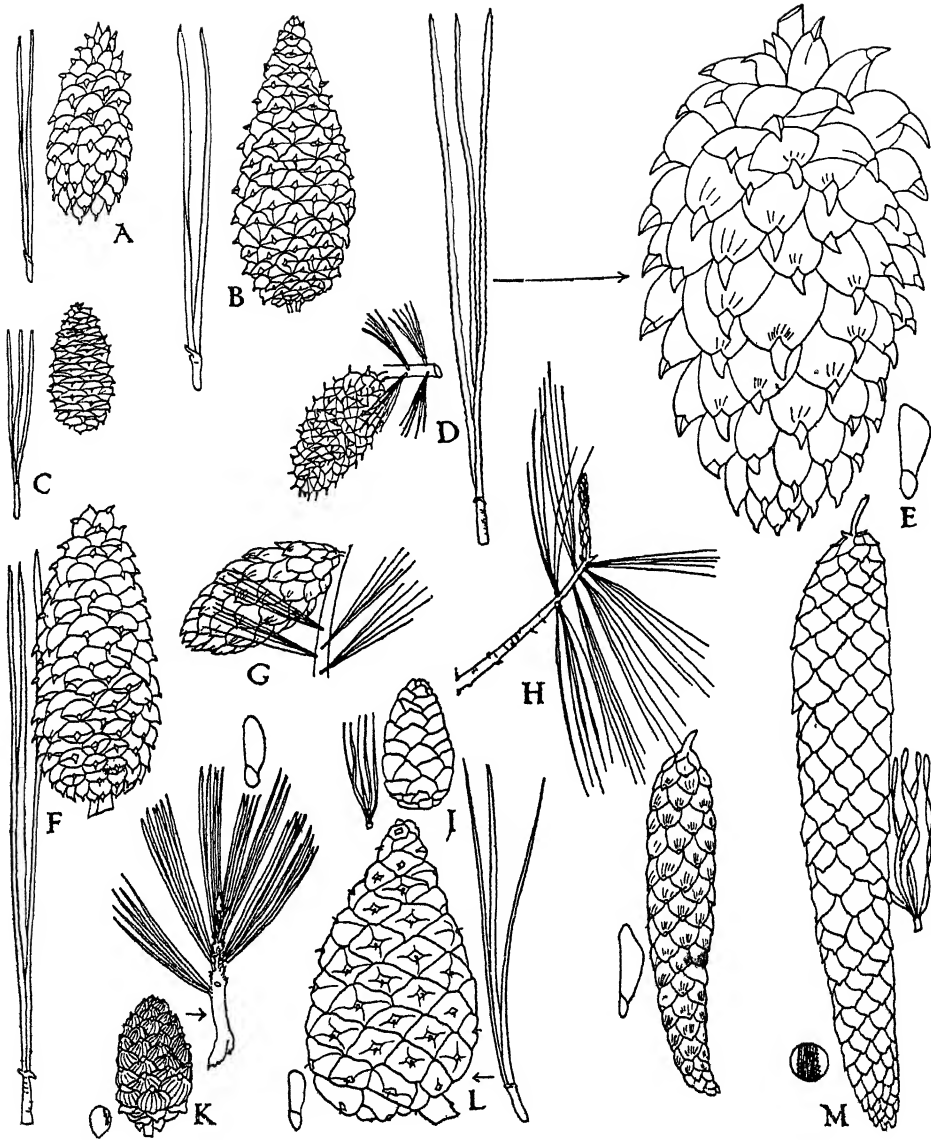


FIG. 46

- A. Bishop Pine, *Pinus muricata*
 B. Maritime or Cluster Pine, *P. Pinaster*
 C. Northern Pitch Pine, *P. rigida*
 D. Bristle-cone or Hickory Pine, *P. aristata*
 E. Big-cone Pine, *P. Coulteri*
 F. Western Yellow Pine, *P. ponderosa*
 G. Limber Pine, *P. flexilis*
 H. Bhutan Pine, *P. excelsa*
 I. Japanese White Pine, *P. parviflora*
 J. Japanese White Pine, *P. parviflora*
 K. Arolla Pine, or Cembran Pine, *P. Cembra*
 L. Monterey Pine, *P. insignis*
 M. Sugar Pine, *P. Lambertiana*

(A, C-G, and M after Sargent.)



FIG 47

- | | | |
|--|--|--|
| A. Douglas Fir, <i>Pseudotsuga Douglasii</i> | G. <i>Tawama cryptomerioides</i> | N. <i>Alcerce, Tetrachnis articulata</i> |
| B. Golden Larch, <i>Pseudolarix Fortunei</i> | H. Western Hemlock, <i>Tsuga Albertiana</i> | O. <i>Thuya dolabrata</i> |
| C. Umbrella Pine, <i>Sciadopitys verticillata</i> | J. Eastern Hemlock, <i>T. canadensis</i> | P. Japanese Arbor-vitae, <i>T. japonica</i> |
| D. Redwood, <i>Sequoia sempervirens</i> | K. Mountain Hemlock, <i>T. Pattoniana</i> | Q. Chinese Arbor-vitae, <i>T. orientalis</i> |
| E. Mammoth Tree, <i>S. (Wellingtonia) gigantea</i> | L. Leaf of Japanese Hemlock, <i>T. Sieboldii</i> | R. American Arbor-vitae, <i>T. occidentalis</i> |
| F. Milanji Cedar, <i>Widdringtonia</i> | M. Deciduous or Swamp Cypress, <i>Taxodium distichum</i> | S. Western Arbor-vitae, <i>T. plicata</i> (<i>T. Lobbii</i>) |
| | | (Genus not figured <i>Glyptostrobus</i>) |



FIG 48

- | | | |
|---|---|--|
| A. <i>Phyllodoce coerulea</i> | F. <i>E. lusitanica</i> | M. Crowberry, <i>Empetrum nigrum</i> |
| B. <i>Bruckenthalia spiculifolia</i> | G. Scotch or Grey Heath, <i>E. cinerea</i> | N. Portuguese Crowberry, <i>Corema album</i> |
| C. St. Dabeoc's Heath, <i>Daboecia (Menziestia) polifolia</i> | H. Cross-leaved Heath, <i>E. tetralix</i> | O. Sea Heath, <i>Frankenia laevis</i> |
| D. Cornish Heath, <i>Erica vagans</i> | J. Fringed Heath, <i>E. ciliaris</i> | P. Ling, or Heather, <i>Calluna vulgaris</i> |
| E. Winter-flowering Heath, <i>E. carnea</i> | K. Alpine Azalea, <i>Loiseleuria procumbens</i> | Q. Himalayan Heather, <i>Cassiope fastigiata</i> |
| | L. <i>Coprosma Petriei</i> | |

(K after Butcher and Strudwick.)

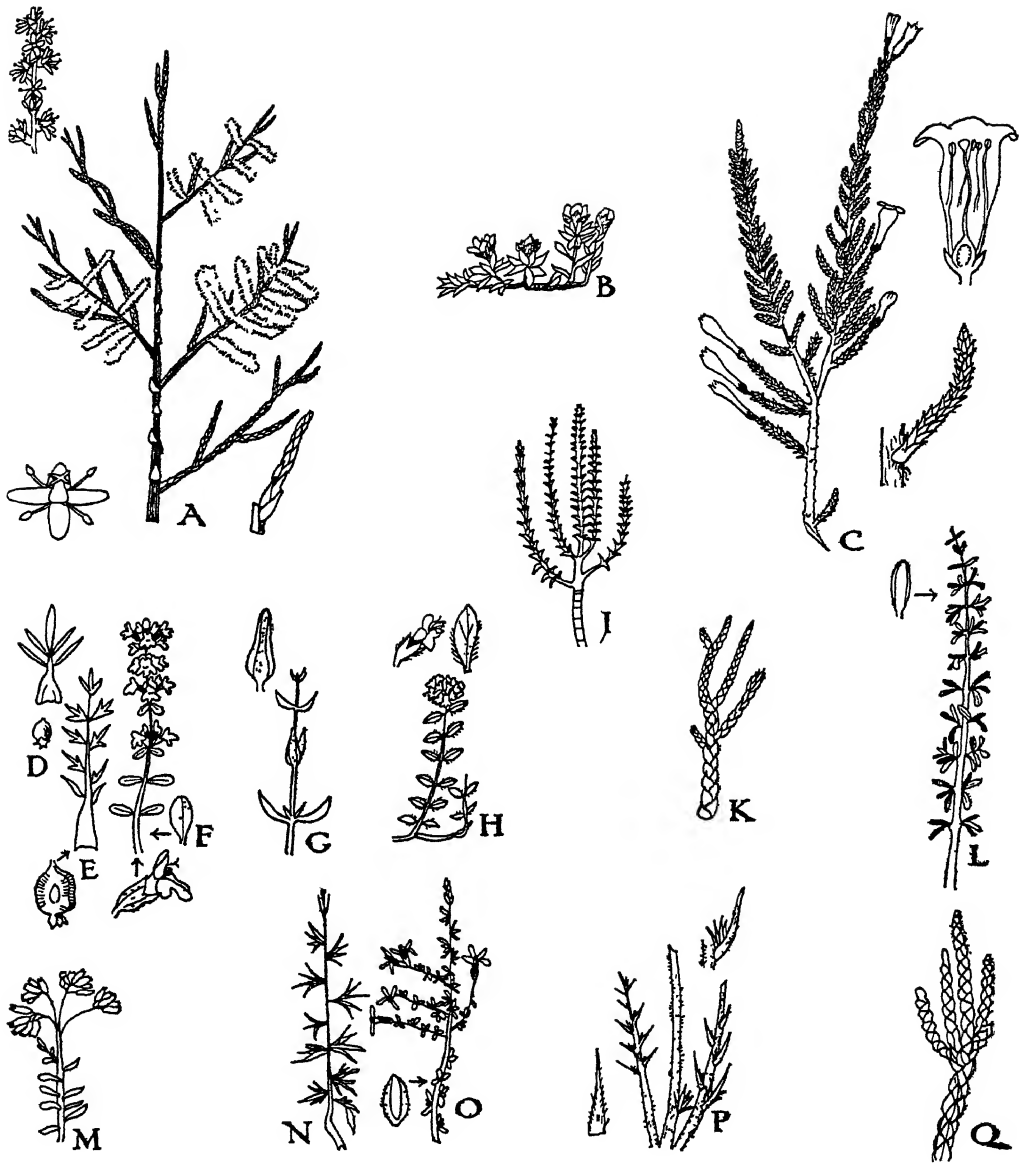


FIG. 49

- | | | |
|--|---|--|
| A. Tamarisk, <i>Tamarix tetrandra</i> | F. Common Thyme, <i>Thymus Chamaedrys</i> | M. Golden Bush, <i>Cassima fulvida</i> |
| B. Flowering Moss, <i>Pyxidanthera barbulate</i> | G. Garden Thyme, <i>T. vulgaris</i> | N. <i>Aplopappus ericoides</i> |
| C. False Heath, <i>Fabiana imbricata</i> | H. Wild Thyme, <i>T. serpyllum</i> | O. <i>Olearia floribunda</i> |
| D. Pearl Fruit, <i>Margyricarpus setosus</i> | J. <i>Veronica cupressioides</i> | P. <i>Camphorosma monspeliacum</i> |
| E. <i>M. alatus</i> | K. <i>Veronica lycopodioides</i> | Q. <i>Veronica Hectori</i> |
| | L. <i>Olearia Solandri</i> | (Genus not figured: <i>Myricaria</i>) |

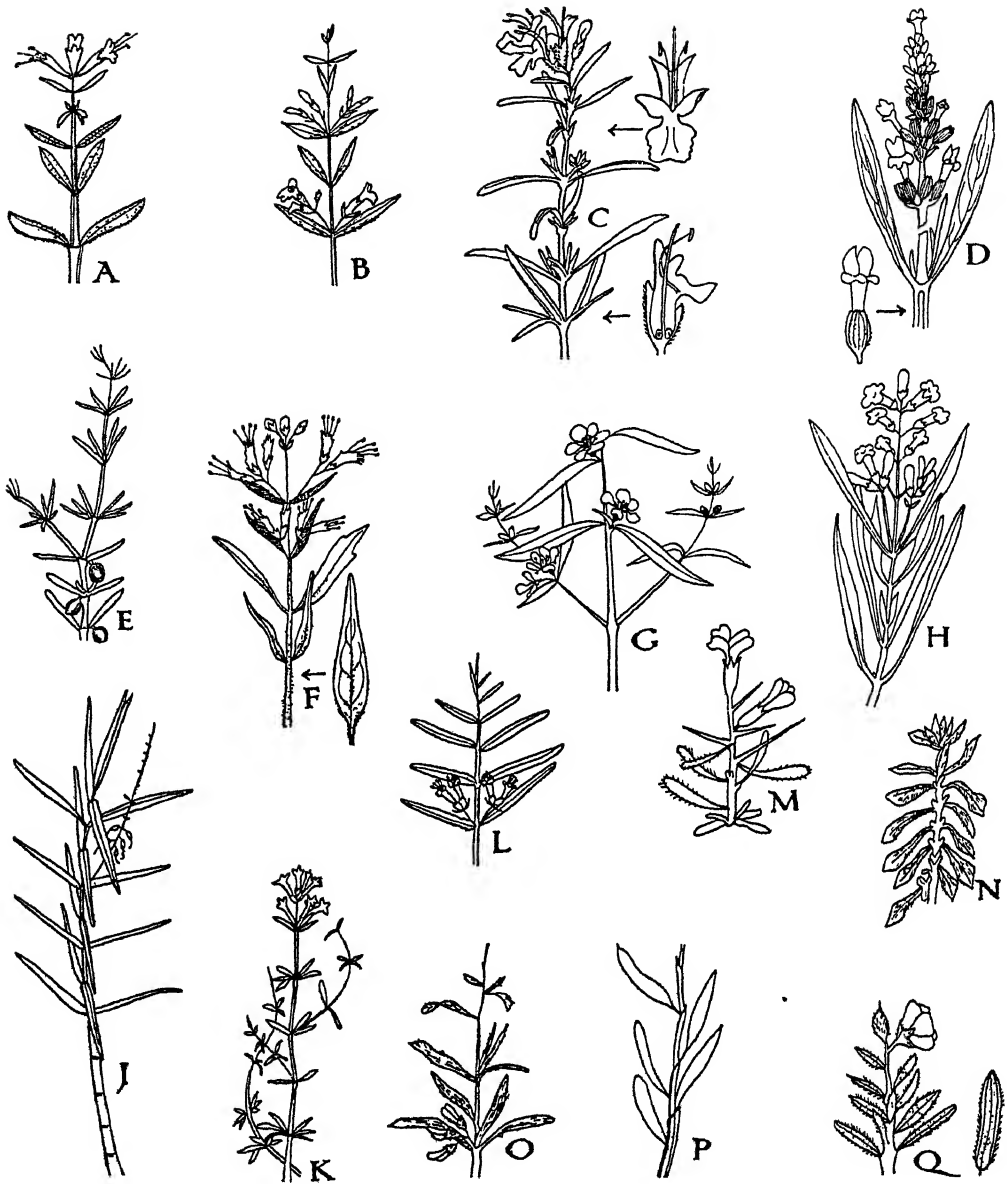


FIG. 50

- | | | |
|--|---------------------------------------|---|
| A. Hyssop, <i>Hyssopus officinalis</i> | E. <i>Coprosma acerosa</i> | M. Spiny Cress Rocket, <i>Vella spinosa</i> |
| B. Winter Savory, <i>Satureia montana</i> | F. <i>Caryopteris mongolica</i> | N. <i>Alyssum argenteum</i> |
| C. Rosemary, <i>Rosmarinus officinalis</i> | G. <i>Nesaea (Heimia) salicifolia</i> | O. <i>Anthyllis Hermanniae</i> |
| D. Lavender, <i>Lavandula vera</i> | H. <i>Freylinia cestroides</i> | P. Goat Wheat, <i>Atraphaxis frutescens</i> |
| | I. <i>Leptodermis Purdomii</i> | Q. <i>Adenandra uniflora</i> |
| | J. <i>Lomcera Albertii</i> | |

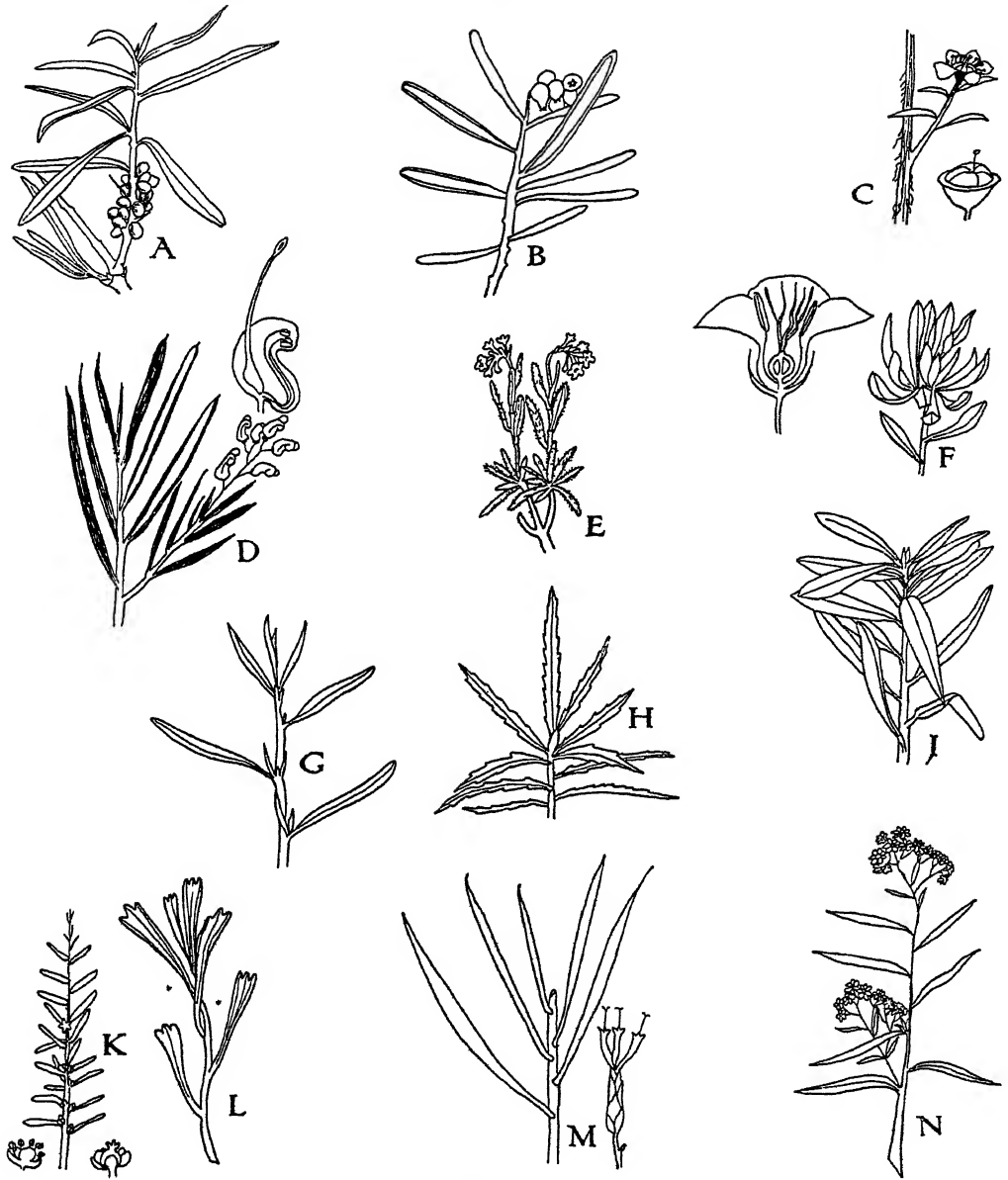


FIG. 51

- | | | |
|--|---|--|
| A. Sea Buckthorn, <i>Hippophae rhamnoides</i> | E. <i>Moltkia petraea</i> | K. Shrubby Goosefoot, <i>Suaeda fruticosa</i> |
| B. Bog Rosemary, <i>Andromeda polifolia</i> | F. Tree Flax, <i>Linum arboreum</i> | L. Sage Brush, <i>Artemisia tridentata</i> |
| C. South Sea Myrtle, or New Zealand Tea Plant, <i>Leptospermum scoparium</i> | G. Orach, or Grey Sage Brush, <i>Atriplex canescens</i> | M. Plumed Golden Rod, <i>Bigelovia graveolens</i> |
| D. <i>Grevillea rosmarinifolia</i> | H. <i>Pittosporum patulum</i> | N. <i>Helichrysum</i> (<i>Ozothamnus</i>) <i>rosmarinifolium</i> |
| | J. <i>P. bicolor</i> | |



FIG 52

A. Marsh Ledum, or Wild
Rosemary, *Ledum*
palustre
B. Evergreen Candytuft,
Iberis sempervirens
C. *Cercocarpus intricatus*
D. Prickly Mimosa, *Acacia*
verticillata

E. *Pyracantha angustifolia*
F. *Hypericum Coris*
G. *Acacia rhamnoides*
H. Shrubby Spurge, *Euphorbia*
Wulfenii
I. Gromwell, *Lithospermum*
prostratum

K. *Spiraea Thunbergii*
L. *Prinsepia uniflora*
M. *Phillyrea angustifolia*
N. *Pentstemon Scouleri*
O. *P. heterophyllus*
P. *Acacia juniperina*



FIG. 53

- A. *Salix incana*
 B. Purple Osier, *S. pur-*
purea
 C. *S. rubra*

F

- D. Common Osier, *S.*
viminalis
 E. *Olearia virgata*
 F. *O. odorata*

- G. *O. lineata*
 H. *Cneorum tricoccum*
 (Genra not figured. Ber-
 beris, *Pseudopanax*)

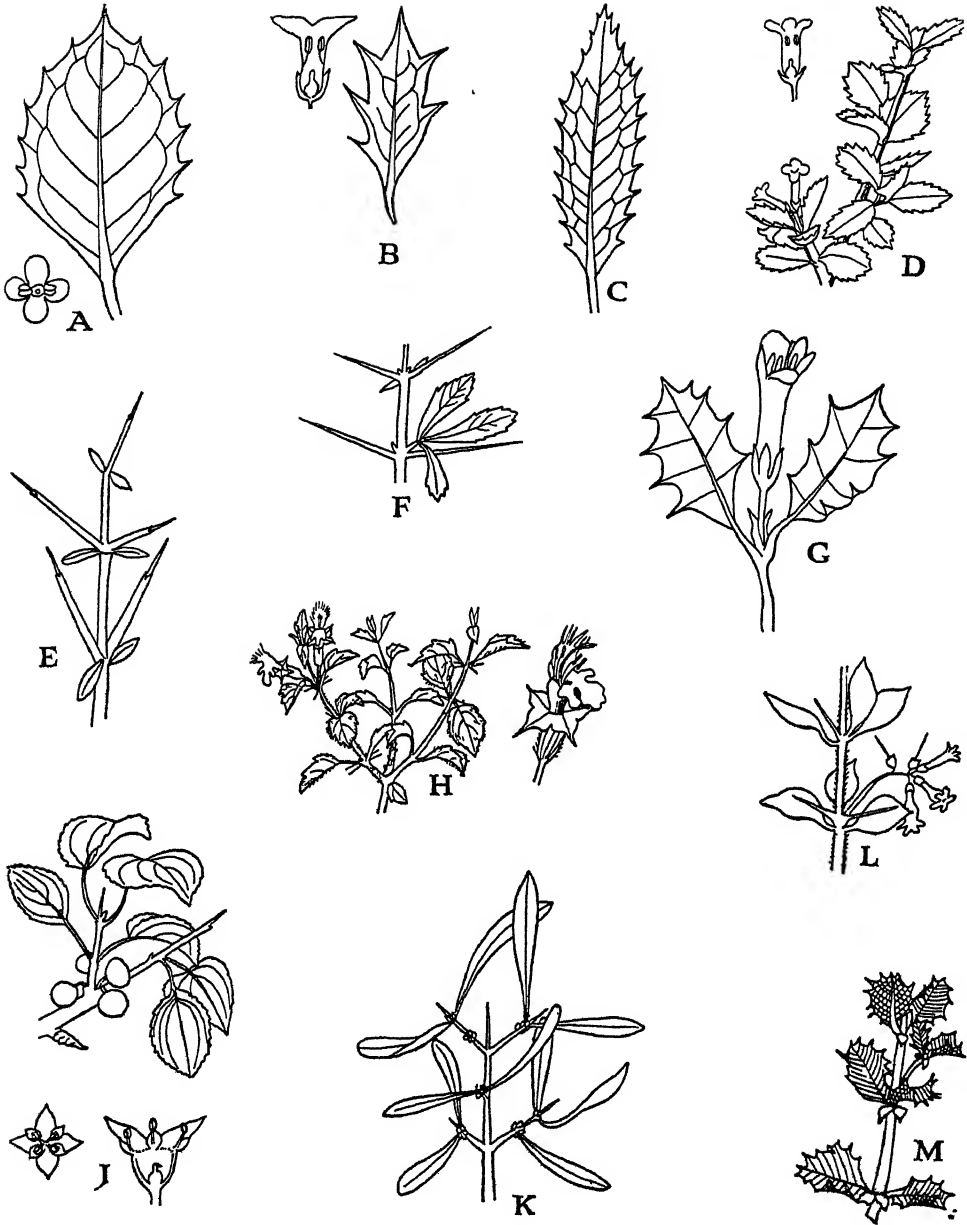


FIG. 54

A. *Osmanthus Fortunei*B. *O. Aquifolium*C. *O. armatus*D. *O. Delavayi*E. Wild Irishman, *Discaria*
*Toumatou*F. *D. serratifolia*G. *Desfontainea spinosa*H. Shrubby Horehound,
*Ballota frutescens*J. Common Buckthorn,
*Rhamnus cathartica*K. Buffalo Berry, *Shepherdia argentea*L. *Raphithamnus cyano-*
*carpus*M. *Ceanothus prostratus*

(Flowers of H after Moggridge.)

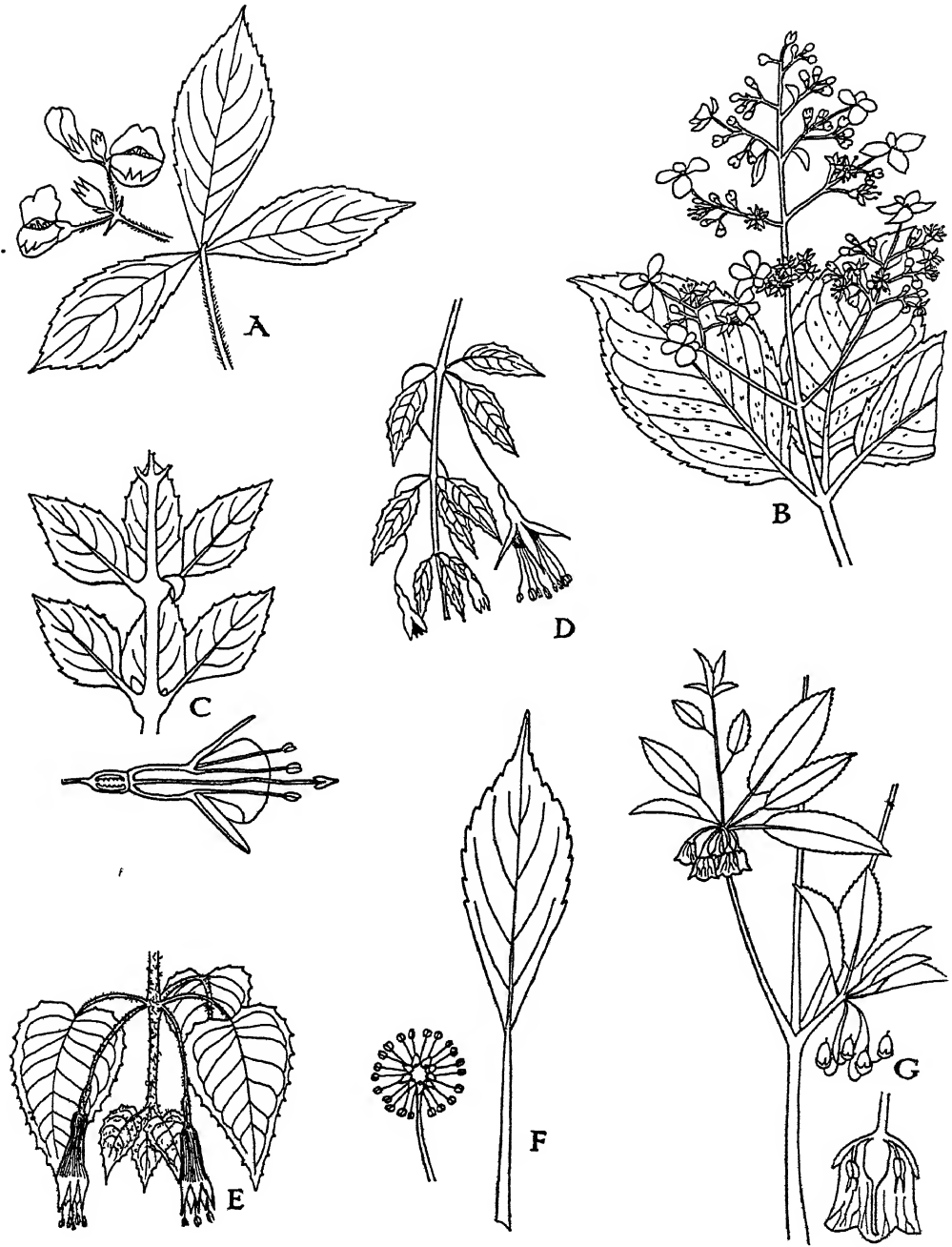


FIG. 55

A. *Bowkeria Gerrardiana*
 B. *Hydrangea paniculata*
 C. *Fuchsia macrostemma*

D. *F. gracilis*
 E. *F. cordifolia*

F. *Trochodendron aralioides*
 G. *Enkianthus campanulatus*



FIG. 56

- | | | |
|--|---|---|
| A. Garden Sage, <i>Salvia officinalis</i> | F. Mint Bush, <i>Prostranthera rotundifolia</i> | M. <i>Ceanothus rigidus</i> (for flowers of <i>Ceanothus</i> see Fig. 86) |
| B. Jerusalem Sage, <i>Phlomis fruticosa</i> | G. <i>P. lasianthos</i> | N. <i>Pachystima Myrsinites</i> |
| C. <i>Salvia Grahami</i> | H. Mitre Flower, <i>Mitraria coccinea</i> | O. <i>Calceolaria integrifolia</i> |
| D. Russian Sage, <i>Perovskia atriplicifolia</i> | J. Twin Flower, <i>Linnaea borealis</i> | P. <i>Colquhounia coccinea</i> |
| E. Germander, <i>Teucrium Chamaedrys</i> | K. <i>Pentstemon cordifolius</i> | (Genus not figured: <i>Leontotis</i>) |
| | L. <i>P. Menziesii</i> | |
- (P after *Botanical Magazine*.)

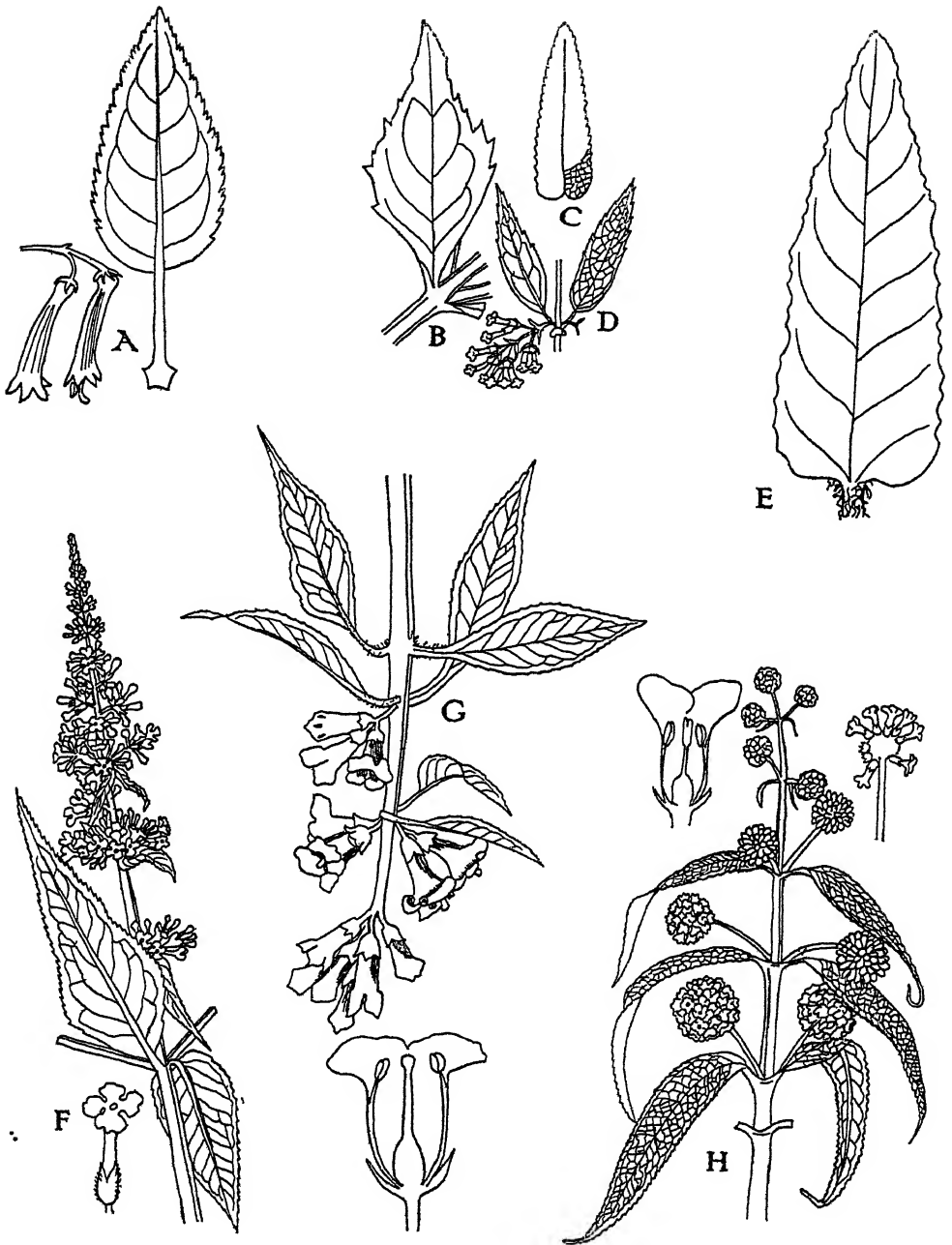


FIG. 57

- | | | |
|--|---|--|
| A. Cape Figwort, <i>Phygelius</i>
<i>capensis</i> | C. South African Sage
Wood, <i>B. salvifolia</i> | F. <i>B. variabilis</i> |
| B. <i>Buddleia Lindleyana</i> | D. <i>B. auriculata</i> | G. <i>B. Colvilei</i> |
| | E. <i>B. Farreri</i> | H. Orange Ball Tree, <i>B.</i>
<i>globosa</i> |



FIG. 58

A. *Hydrangea hortensis*
 B. *H. Davidii*
 C. *H. petiolaris*

D. *H. villosa*
 E. *H. Sargentiana*
 F. *H. Bretschneideri*

G. *H. involucrata*
 H. *Schizophragma hydrangeoides*

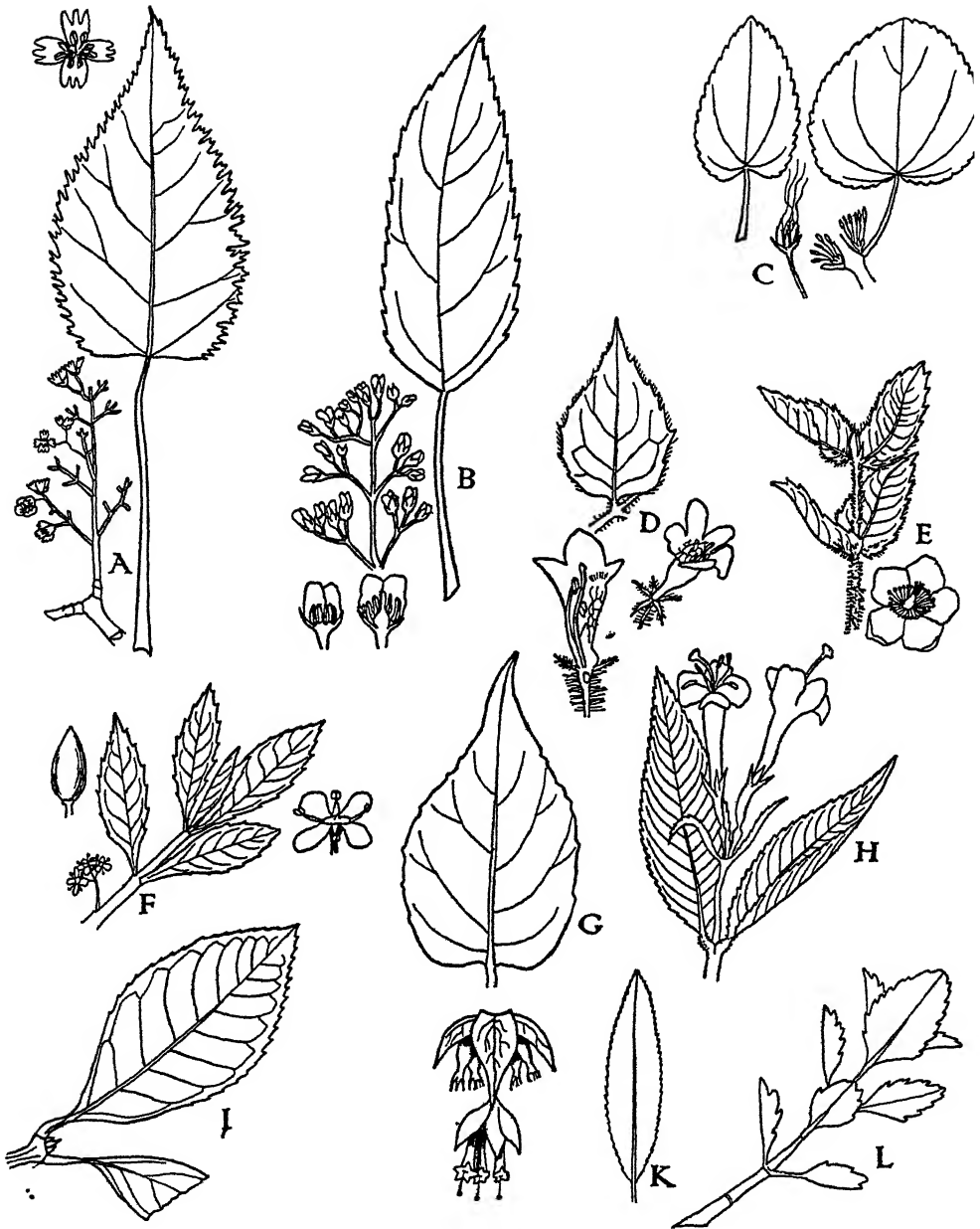


FIG. 59

A. *Aristotelia racemosa*B. *A. Macqui*C. Katsura Tree, *Cercidiphyllum japonicum*D. *Kolkwitzia amabilis*E. *Eucryphia cordifolia*F. *Elaeodendron capense*G. Flowering Nutmeg, *Leycesteria formosa*H. *Diervilla (Weigela) floribunda*J. *Olea fragrans*(F after *Botanical Magazine*.)K. *Osmanthus serrulatus* (see Fig. 54 A-D)L. *Veronica Hulkeana*(Genera not figured: *Acer*, *Forestiera*)



FIG. 60

- A. Golden Bell, *Forsythia
suspensa*
B. Spotted Laurel, *Aucuba
japonica*
C. *Laurelia serrata*

- D. *Euonymus japonicus*
E. *E. pendulus*
F. *E. latifolius*
G. Common Spindle Tree,
E. europaeus

- H. *E. radicans*
I. *Phillyrea latifolia*
J. *Eupatorium micranthum*
K. *Anopterus glandulosa*
L. Tasmanian Laurel,

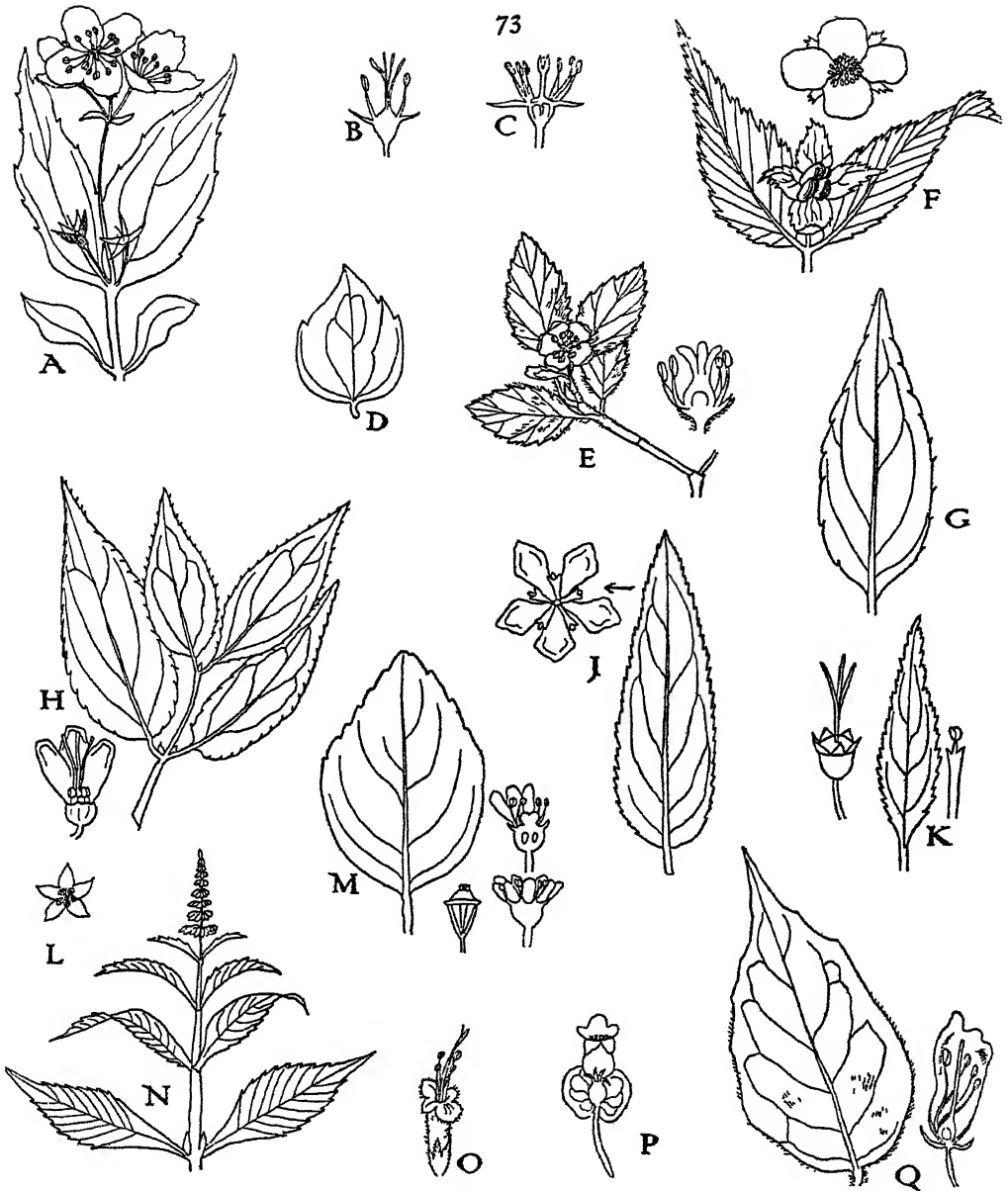


FIG. 61

- A. Mock Orange, or *Syringa*, *Philadelphus coronarius*
 B. Flower of *P. Lewisii* with petals removed
 C. Ditto, *P. Delavayi*
 D. Leaf of *P. purpureo-maculatus*
 E. *Jamesia americana*
 F. White Kerria, *Rhodotypos kerrioides*
 G. *Deutzia discolor*
 H. *D. scabra*
 I. *D. longifolia*
 J. *D. longifolia*
 K. *D. gracilis*

- L. Flower of *D. setchuenensis*
 M. *Decumaria barbara*
 N. *Elsholtzia Stauntonii*
 O. Flower of *E. polystachya*
 P. *Dipelta ventricosa*
 Q. Flower of *D. floribunda*

(O after Collett.)

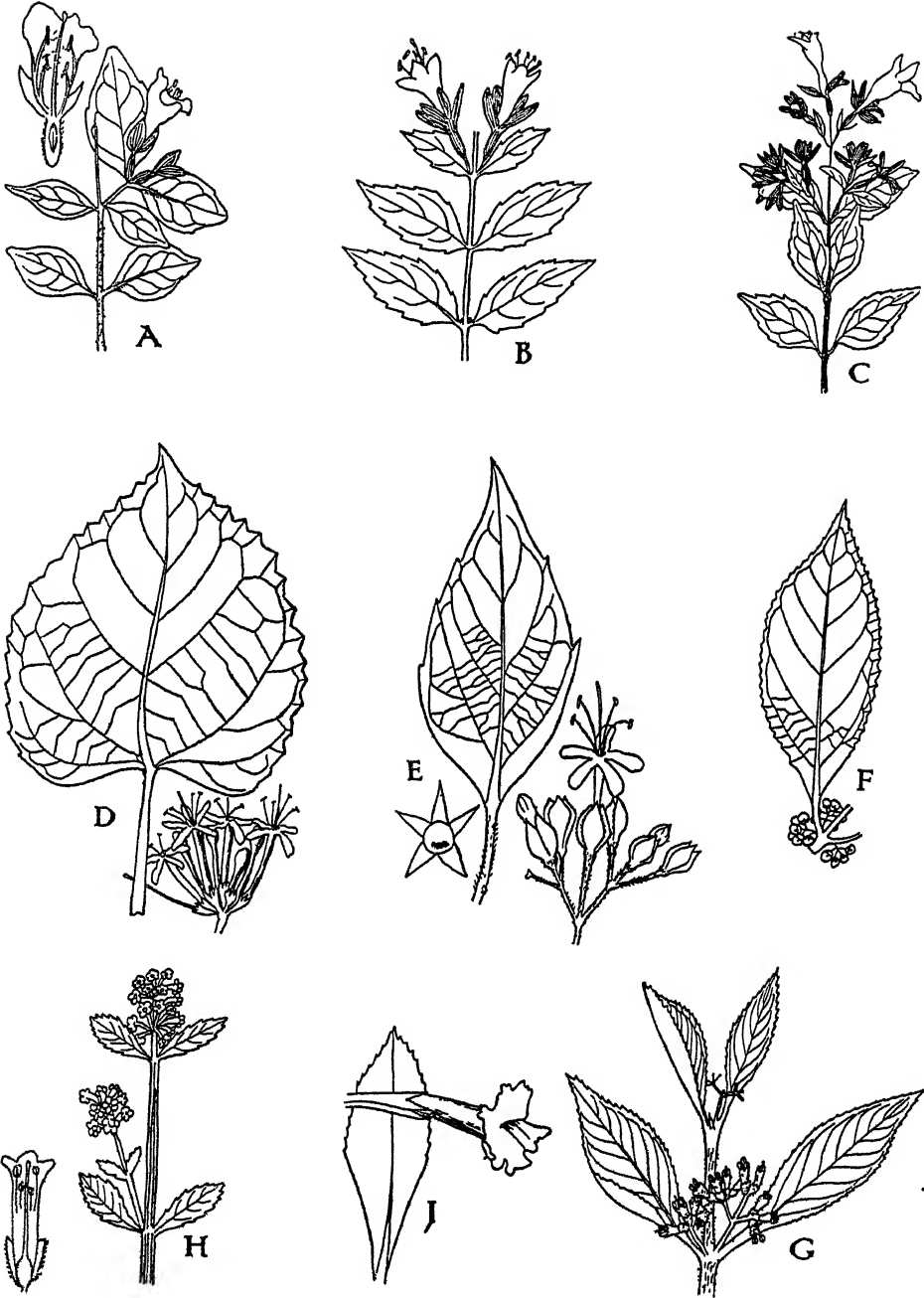


FIG. 62

A. *Abelia Schumannii*
 B. *A. grandiflora*
 C. *A. chinensis*

D. *Clerodendron foetidum*
 E. *C. trichotomum*
 F. *Callicarpa Giraldiviana*

G. *Murasaki, C. japonica*
 H. *Diostea juncea*
 J. *Diplacus glutinosus*

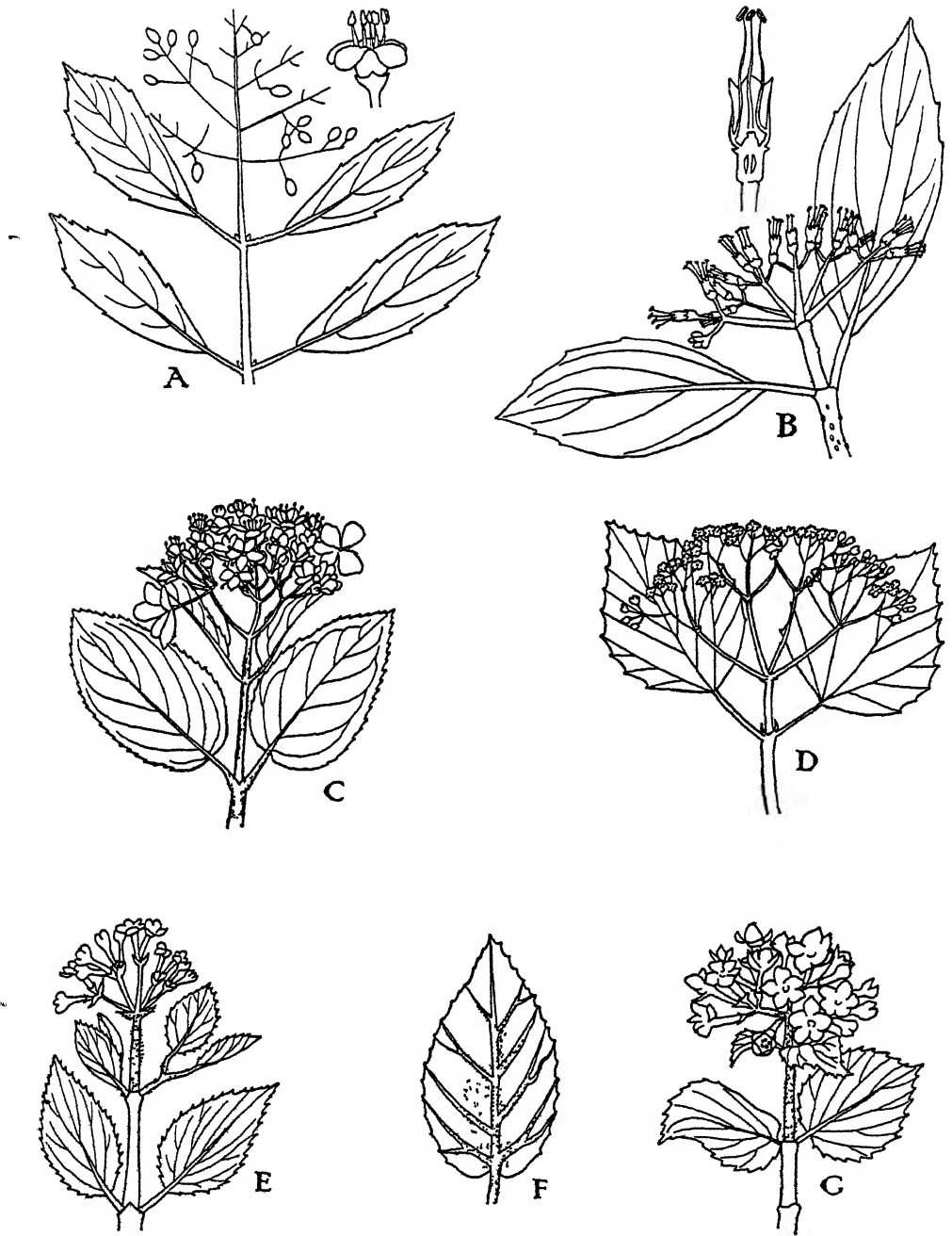


FIG 63

A. *Viburnum Henryi*B. *V. coriaceum*C. Chinese Snowball Tree,
*V. macrocephalum*D. *V. betulifolium*E. *V. bitchiuense*F. Leaf of *V. buddleifolium*G. *V. Carlesii*

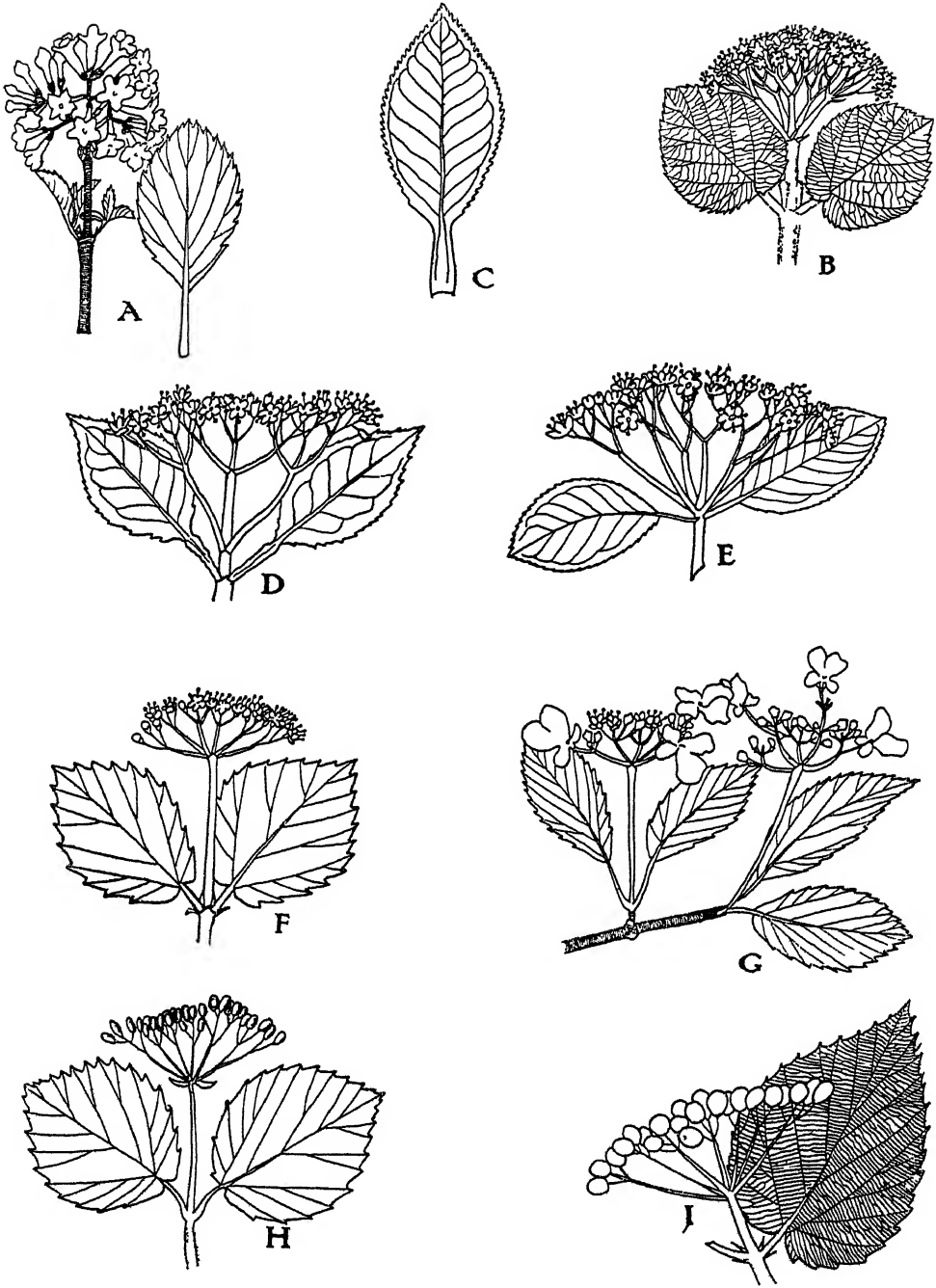


FIG. 64

A. *Viburnum fragrans*B. Wayfaring Tree, *V. Lantana*C. Leaf of Sheepberry, *V. Lentago*D. Withe Rod, *V. nudum*E. Blackhaw, *V. prunifolium*F. *V. molle*G. *V. tomentosum*H. *V. venosum*J. *V. lobophyllum*



FIG. 65

- A. *Laurustinus*, *Viburnum Tinus*
 B. *V. odoratissimum*
 C. Leaf of *V. Davidii*
 D. *V. rhytidophyllum*
 E. *V. cotinifolium*
 F. *V. Harryanum*

- G. *V. utile*
 H. Diagram of a cymose branched cluster (see footnote on page 4)



FIG 66

A. Lemon-scented Verbena,
Lippia (Aloysia) citriodora
B. *Teucrium fruticans*
C. *Correa speciosa*

D. *Veronica pinguifolia*
E. *V. Traversii*
F. *V. salicifolia*
G. *V. Colensoi*

H. *V. speciosa*
I. *V. anomala*
K. *V. amplexicaulis*
L. *V. buxifolia*

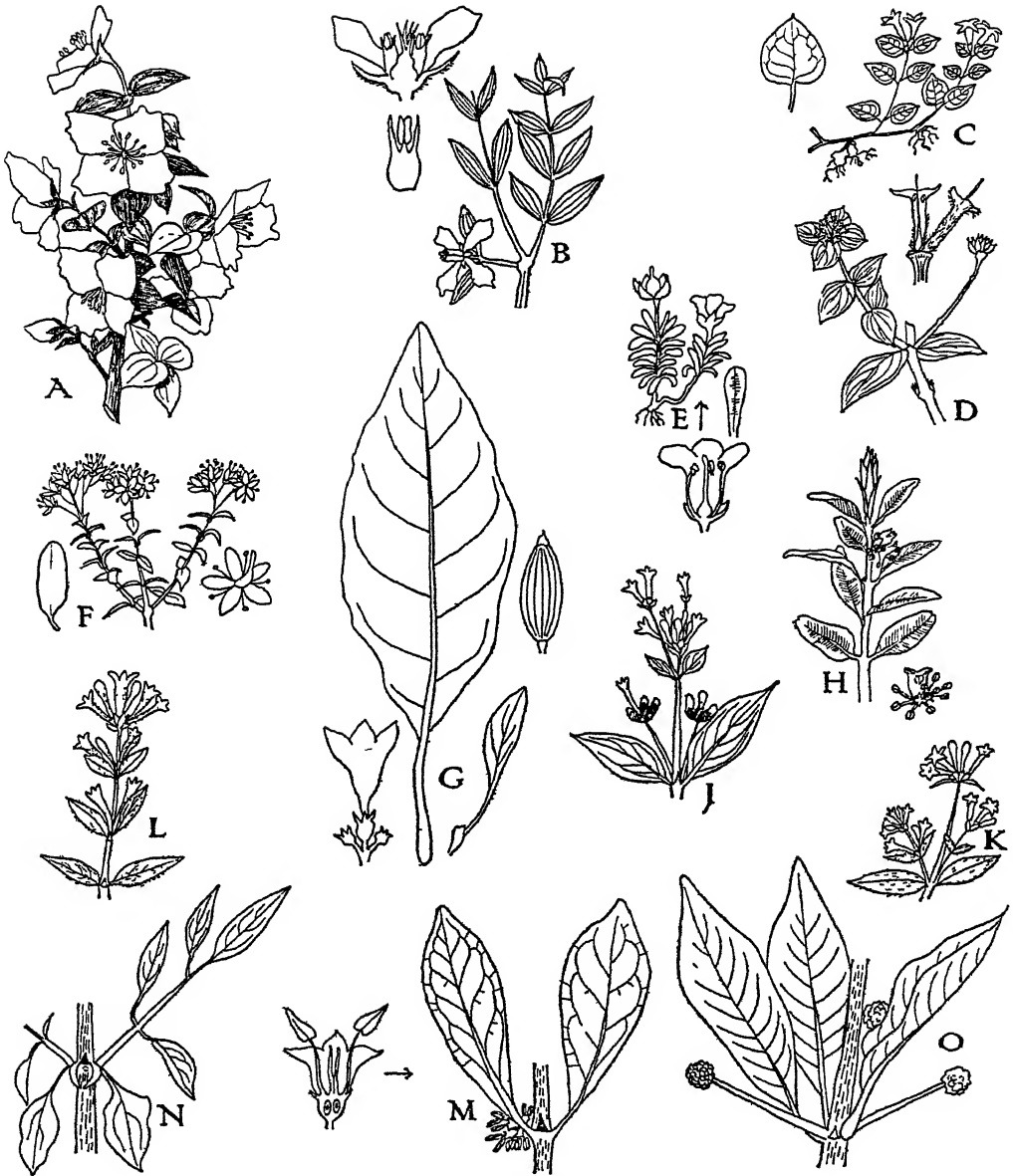


FIG. 67

A. *Philadelphus microphyllus*
 B. *Fendlera rupicola*
 C. Partridge Berry, *Mit-
 chella repens*
 D. *Pimelea ligustrina*
 E. *Diapensia lapponica*

F. Sand Myrtle, *Leio-
 phyllum buxifolium*
 G. *Emmenopterys Henryi*
 H. Common Box, *Buxus
 sempervirens*
 I. *Leptodermis lanceolata*
 K. *L. pilosa*

L. *L. oblonga*
 M. *Coprosma lucida*
 N. *C. foetidissima*
 O. Button Bush, *Cephalan-
 thus occidentalis*
 (Genera not figured: *Lu-
 culia, Paederia*)

(A after Robinson.)



FIG. 68

A Rose of Sharon, *Hypericum calycinum*

B. *H. patulum*

C. *H. elatum*

D. Tutsan, *H. Androsaemum*

E. St. Andrew's Cross, *Ascyrum hypericoides*

F. *Cistus villosus*

G. *C. corbariensis*

H. Gum Cistus, *C. ladani-ferus*

J. Bush Rock Rose, *C. laurifolius*

K. Hoary Rock Rose, *Helianthemum canum*

L. White Rock Rose, *H. appenninum*

M. Common Rock Rose, *H. vulgare*

(K and L after Butcher and Strudwick.)



FIG. 69

A. Fringe Tree, *Chionanthus virginica*

C. *Jasminum Beesianum*

F. Himalayan Lilac, *S. emodi*

B. *Fontanesia phillyreoides*

E. Common Lilac, *Syringa vulgaris*

G. Persian Lilac, *S. persica*

H *S. villosa*

(Flowers of D after Berg and Schmidt.)

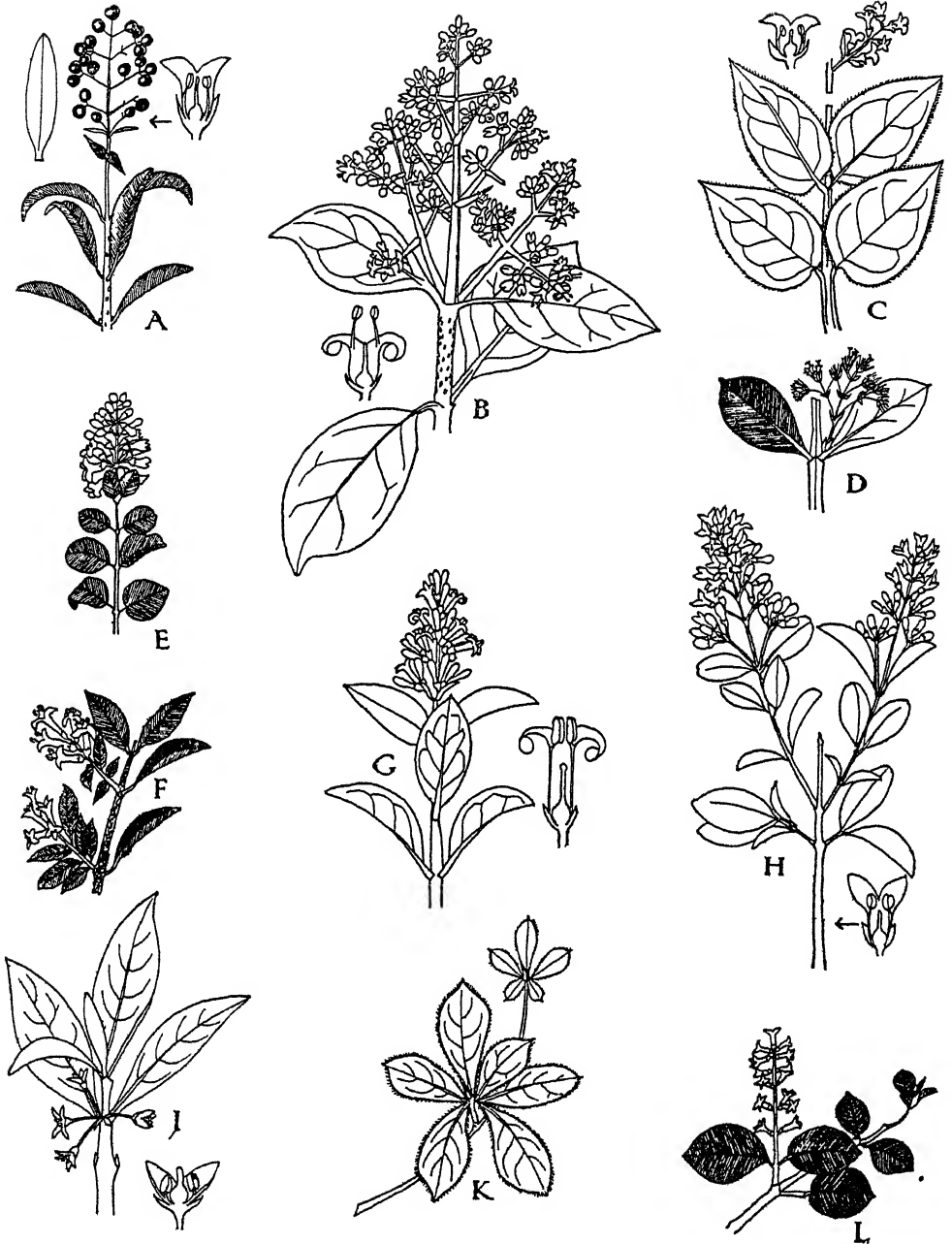


FIG. 70

- A. Common Privet, *Ligustrum vulgare*
 B. *L. lucidum*
 C. *Abeliophyllum distichum*
 D. *Olearia Traversii*

- E. *Ligustrum ionandrum*
 F. *L. Prattii*
 G. *L. ovalifolium*
 H. Chinese Privet, *L. sinense*

- J. *Phillyrea decora*
 K. *Rhododendron quinquefolium* (for flowers of *Rhododendron* see Figs. 122 and 123)
 L. *Parasyringa sempervirens*



FIG. 71

A. *Abelia Engleriana*B. *A. triflora*C. Coral Berry, or Indian Currant, *Symphoricarpos orbiculatus*D. *S. mollis*Dd. Flowers of Wolfberry, *S. occidentalis*E. Common Honeysuckle, *Lonicera Periclymenum*F. Perfoliate Woodbine, *L. Caprifolium*G. Trumpet Honeysuckle, *L. sempervirens*H. *L. japonica*J. *L. nitida*K. *L. pileata*L. *L. thibetica*M. *L. Myrtillus*N. *L. tricosantha*

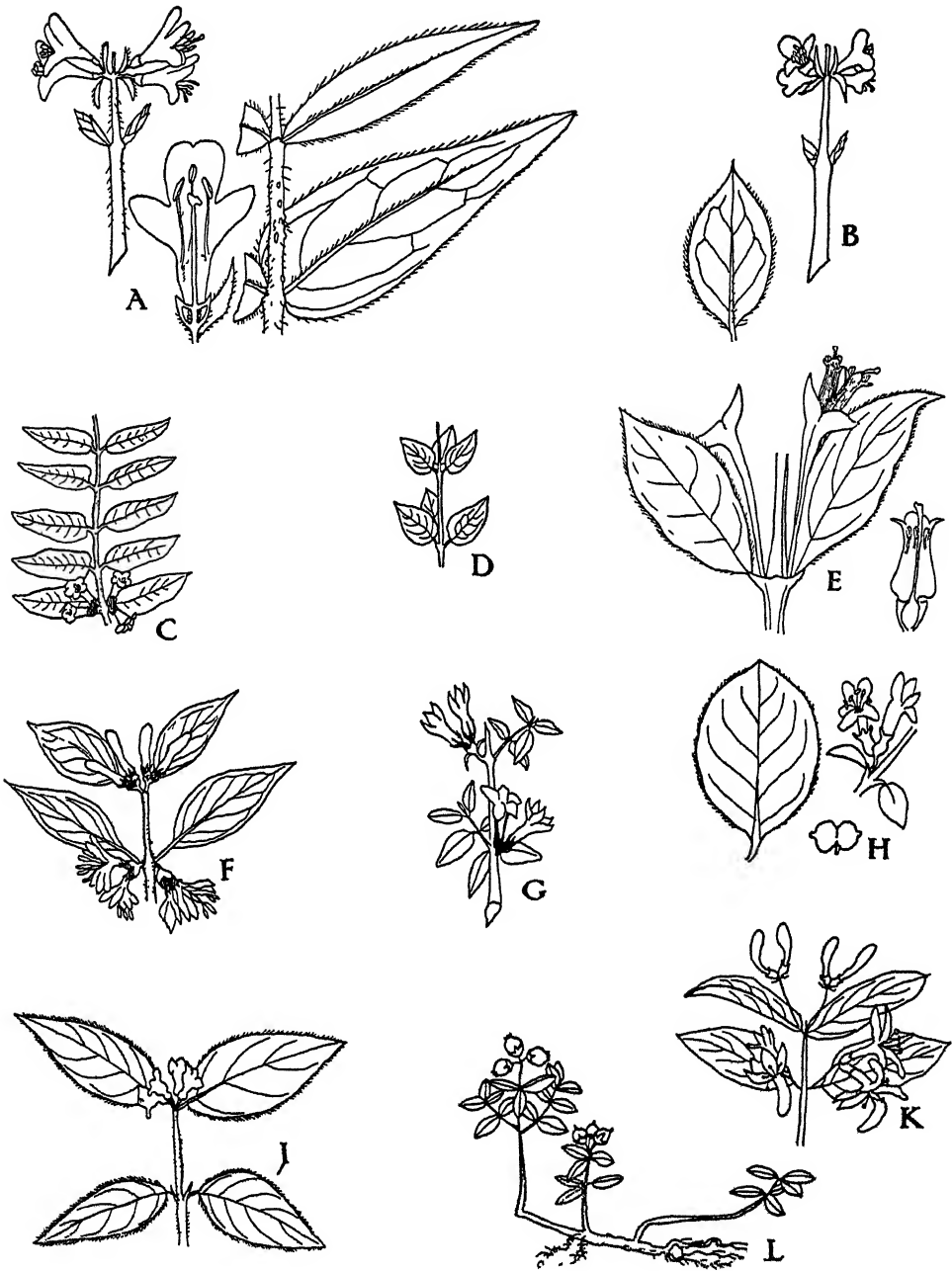


FIG. 72

A. *Lonicera Standishii*
 B. *L. fragrantissima*
 C. *L. tomentella*
 D. *L. rupicola*

E. *L. Ledebouri*
 F. *L. Maackii*
 G. *L. syringantha*
 H. Fly Honeysuckle, *L. Xylosteum*

J. *L. Ferdinandii*
 K. *L. tatarica*
 L. *L. Arcterica nana*

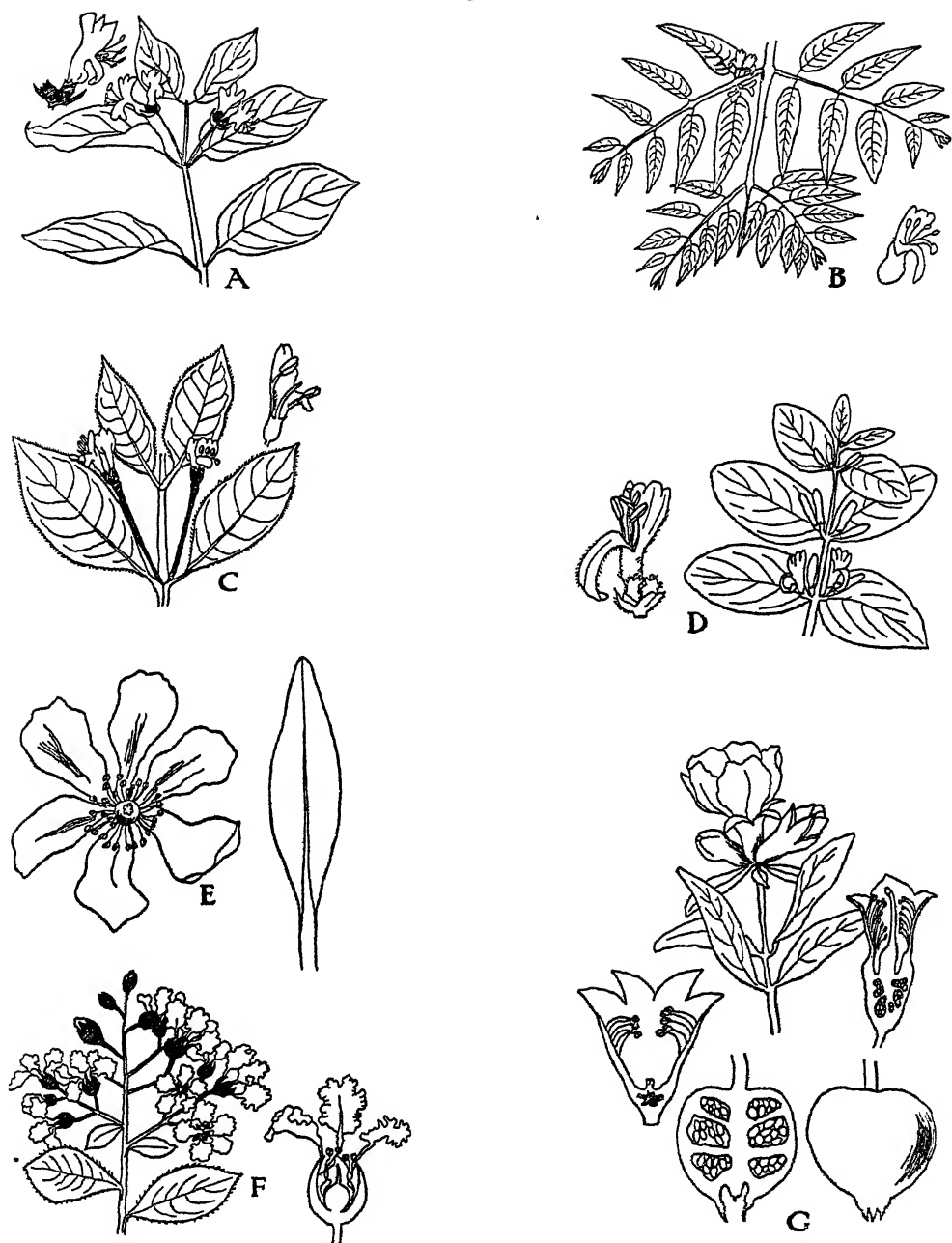


FIG. 73

A. *Lonicera chrysantha*B. *L. deflexicalyx*C. Cherry Woodbine, *L. alpigena*D. *L. quinquelocularis*E. Californian Mock Orange, *Carpenteria californica*F. Crape Myrtle, *Lagerstroemia indica*G Pomegranate, *Punica granatum*

(Flower of E after a photograph.)

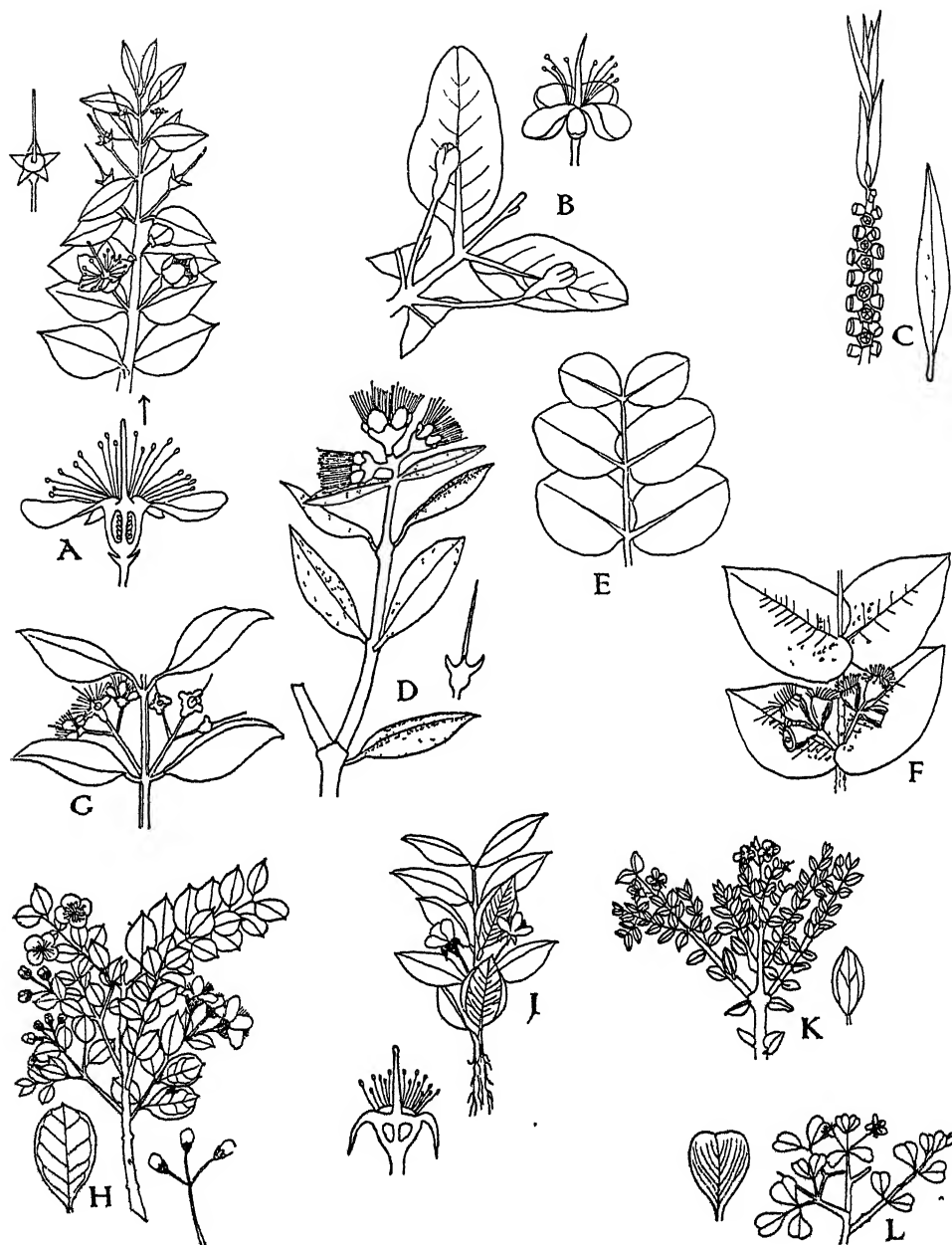


FIG 74

A. Common Myrtle, *Myrtus communis*

B. *Feijoa Sellowiana*

C. Leaf and fruits of Bottle-brush Tree, *Callistemon*

D. Southern Rata, *Metrosideros lucida*

E. Young shoot of Cider Gum, *Eucalyptus Gunnii*

F. Ditto of *E. cordata*

G. *Eugenia myrtifolia*

H. *E. apiculata* (*Myrtus Luma*)

J. *Myrtus Ugni*

K. *M. nummularia*

L. *M. obcordata*
(Genus not figured: *Mela-leuca*)



FIG 75

- A. Common Dogwood, *Cornus sanguinea*
 B. Cornel, or Cornelian Cherry, *C. mas*
 C. *C. florida*

- D. *C. kousa*
 E. *C. nuttallii*
 F. *C. alba*
 G. *C. capitata*

(G after Collett.)



FIG. 76

A. *Garrya elliptica*
 B. *Coriaria terminalis*
 C. *Pileostegia viburnoides*
 D. *Mandevilla suaveolens*

E. *Marsdenia erecta*
 F. Silk Vine, *Periploca*
 graeca
 G. Mistletoe, *Viscum album*

H. *Araujia sericofera*
 (Genus not figured: *Metaplexis*)

(H and flowers of F after Kirk.)

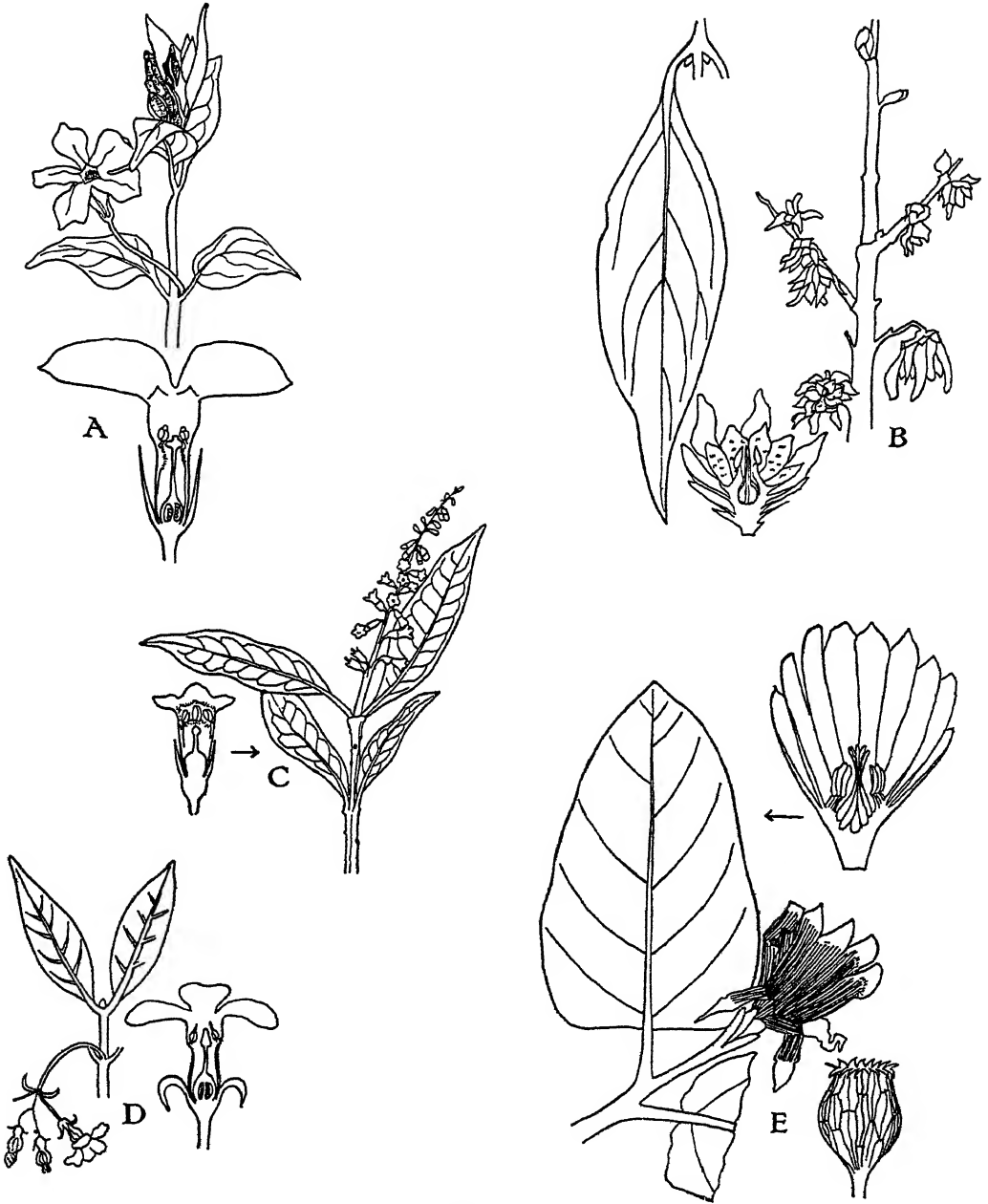


FIG. 77

- A. Greater Periwinkle, *Vinca major* C. Fiddle Wood, *Citharexylum quadrangularis* E. Californian Allspice, *Calycanthus occidentalis*
 B. Wintersweet, *Chimonanthus fragrans* D. *Trachelospermum jasminoides* (Genera not figured: *Acer*, *Kalmia*)

(Section of flower of E after Le Maout and Decaisne, fruit after Kerner.)



FIG 78

- A. *Schizandra chinensis*
 B. Fruits of *S. rubriflora*
 C. *Tetracentron sinense*
 D. *Kadsura chinensis*
 E. *Euptelea Franchetii*

- F. *E. polyandra*
 G. Leaf of *Hymenanthera chathamica*
 H. *Azara microphylla*
 J. *A. Gilliesii*

- K. Strangle Bush, or Coral Barberry, *Berberidopsis corallina*
 L. *Poliothyrsis sinensis*
 M. *Melicytus ramiflorus*

(Flowers and fruits of C after Hooker, fruits of E after a drawing.)



FIG. 79. DECIDUOUS BARBERRIES

A. *Berberis aetnensis*
 B. *B. aggregata*
 C. *B. aristata*
 D. *B. brachypoda*
 E. *B. concinna*

F. *B. dictophylla*
 G. *B. diaphana*
 H. *B. polyantha*
 J. *B. Sieboldii*
 K. *B. Thunbergii*

L. *B. Wilsonae*
 M. Common Barberry, *B. vulgaris*
 N. *B. Vernae*
 O. *B. yunnanensis*

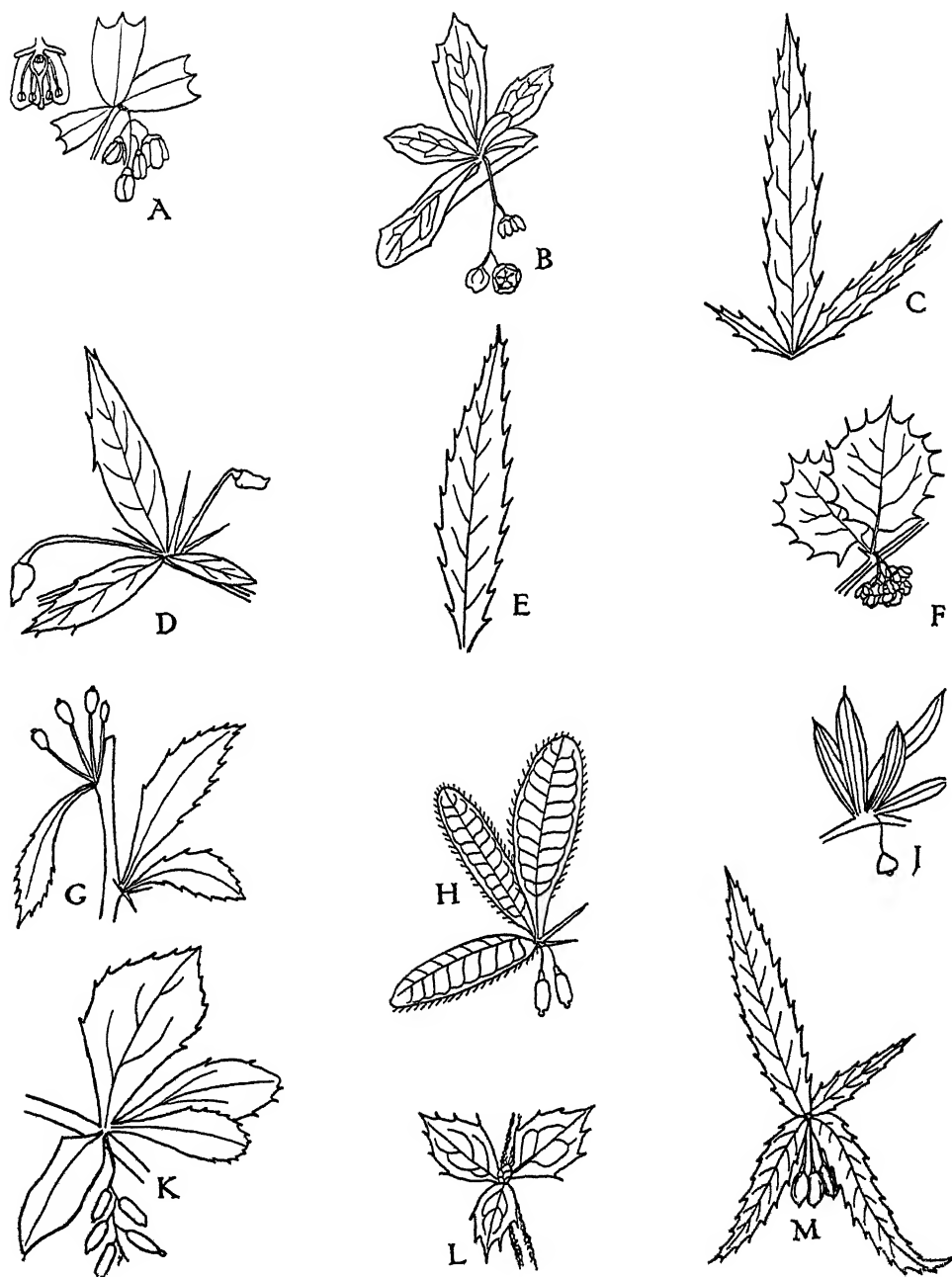


FIG. 80. EVERGREEN BARBERRIES

A. *Berberis Darwinii*
 B. *B. Lycium*
 C. *B. Gagnepainii*
 D. *B. Hookeri*

E. *B. insignis*
 F. *B. hakeoides*
 G. *B. pruinosa*
 H. *B. Sargentiana*

J. *B. stenophylla*
 K. *B. chitria*
 L. *B. verruculosa*
 M. *B. Veitchii*

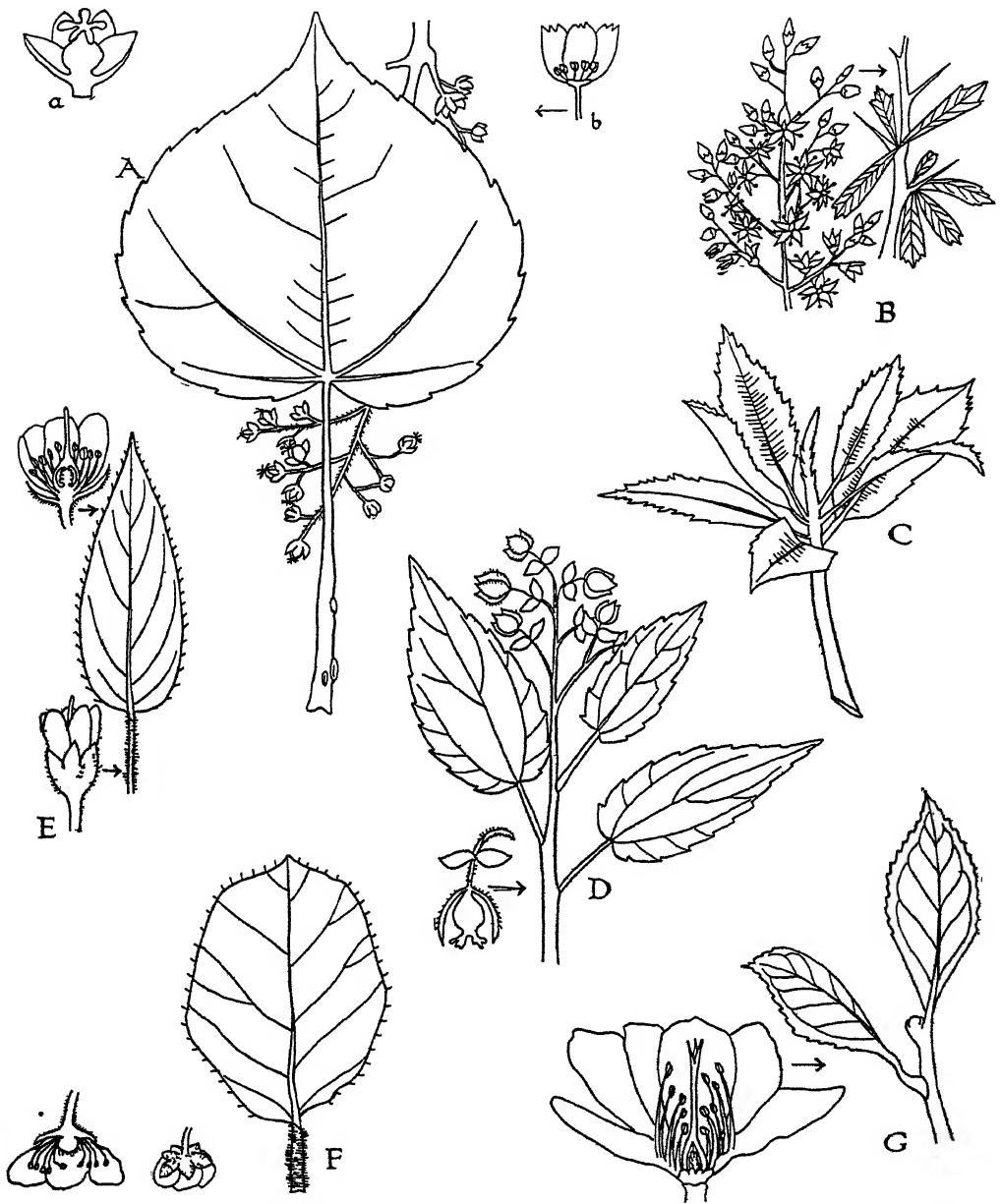


FIG. 81

A. *Idesia polycarpa*
 Aa. Ditto, female flower
 Ab. Ditto, male flower

B. *Bursaria spinosa*
 C. *Pittosporum Dallii*
 D. *Carrierea calycina*

E. *Clematoclethra scandens*
 F. *Actinidia chinensis*
 G. *Camellia japonica*

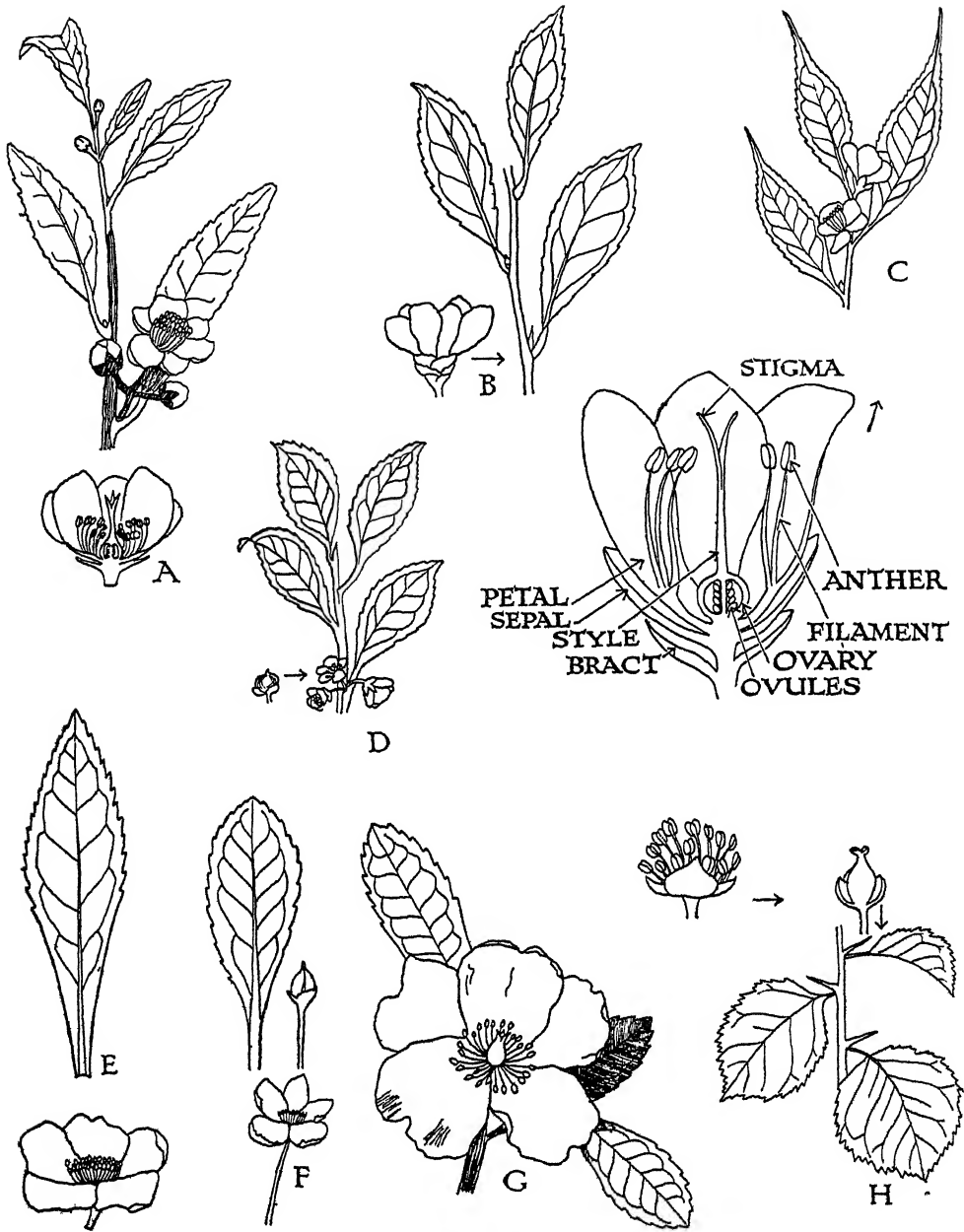


FIG. 82

A. Tea Plant, *Camellia Thea*D. *Eurya japonica*G. *G. axillaris*B. *C. Sasanqua*E. *Gordonia Altamaha*F. Loblolly Bay, *G. Lasianthus*H. Tung-Ching Tree, *Xylosma racemosa*C. *C. cuspidata*

(Flowers of A after Wossidlo, E and F after Sargent, G after a photograph, H from Kew Herbarium and after Le Maout and Decaisne.)

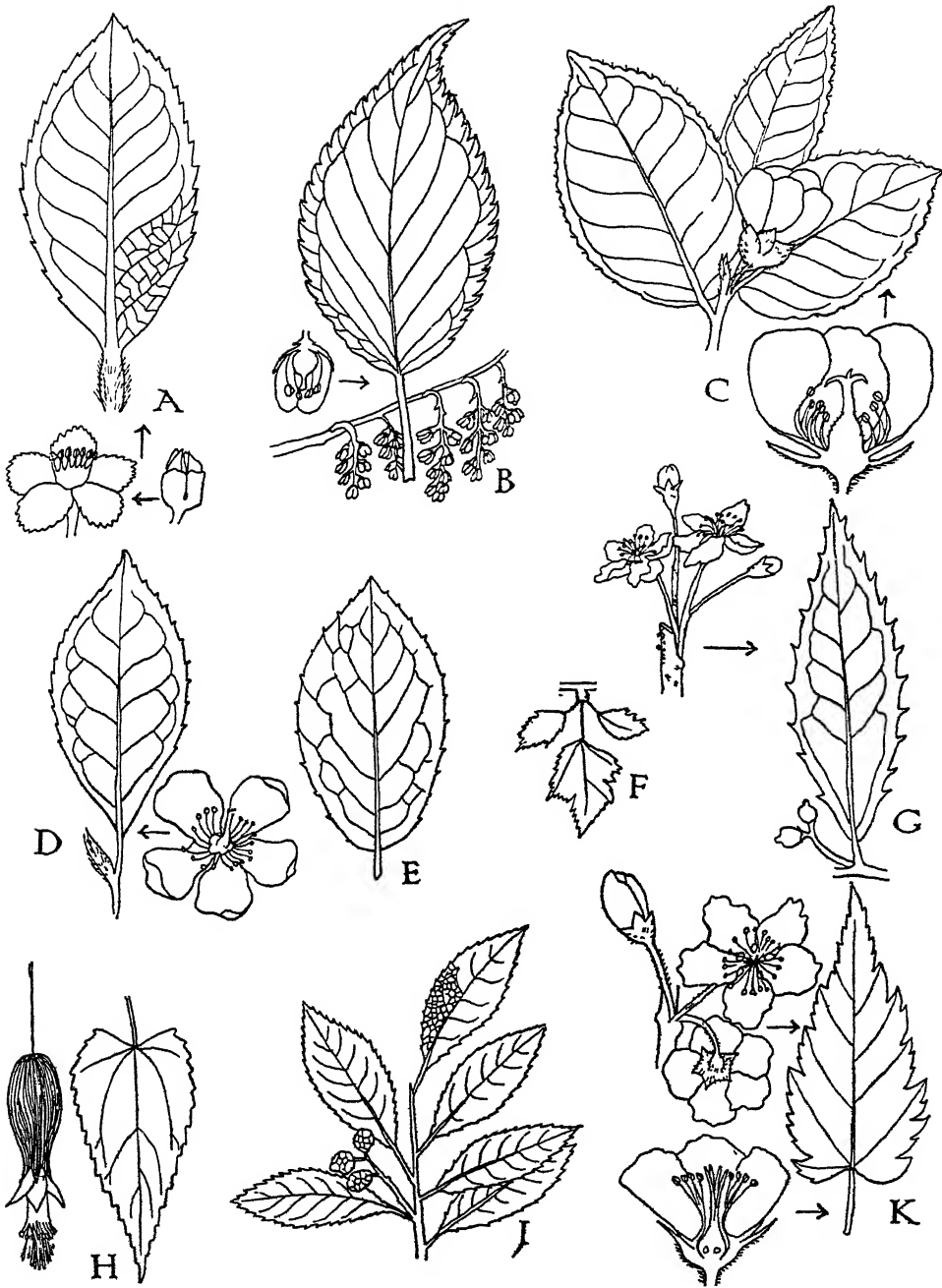


FIG. 83

A. *Hartia sinensis*B. *Stachyurus chinensis*C. *Stewartia Pseudocamellia*D. *S. Malacodendron*E. *S. pentagyna*F. *Plagianthus betulinus*G. *Hoheria populnea*H. *Abutilon megapotamicum*J. *Elaeocarpus cyaneus*K. *Hoheria* (Plagianthus)
Lyallii

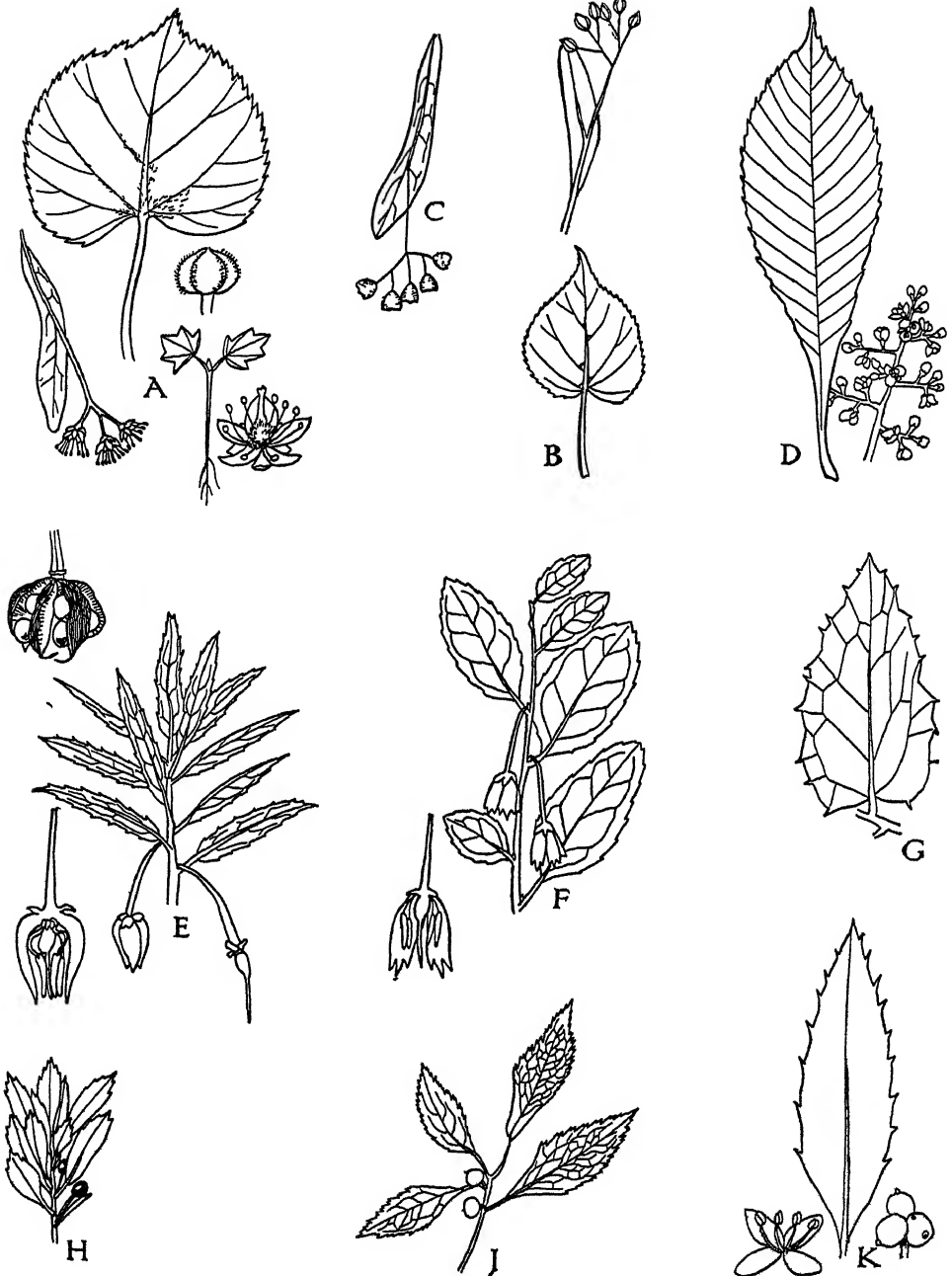


FIG. 84

- A. Large-leaved Lime, *Tilia platyphyllos*
 B. Small-leaved Lime, *T. cordata*
 C. Fruits of Common Lime, *T. vulgaris*

- D. *Meliosma cuneifolia*
 E. *Tricuspidaria lanceolata* (*Crinodendron Hookerianum*)
 F. *T. dependens*
 G. *Villaresia mucronata*

- H. Inkberry, *Ilex glabra*
 J. Winter Berry, or Black Alder, *I. verticillata*
 K. Himalayan Holly, *I. diphyrena*

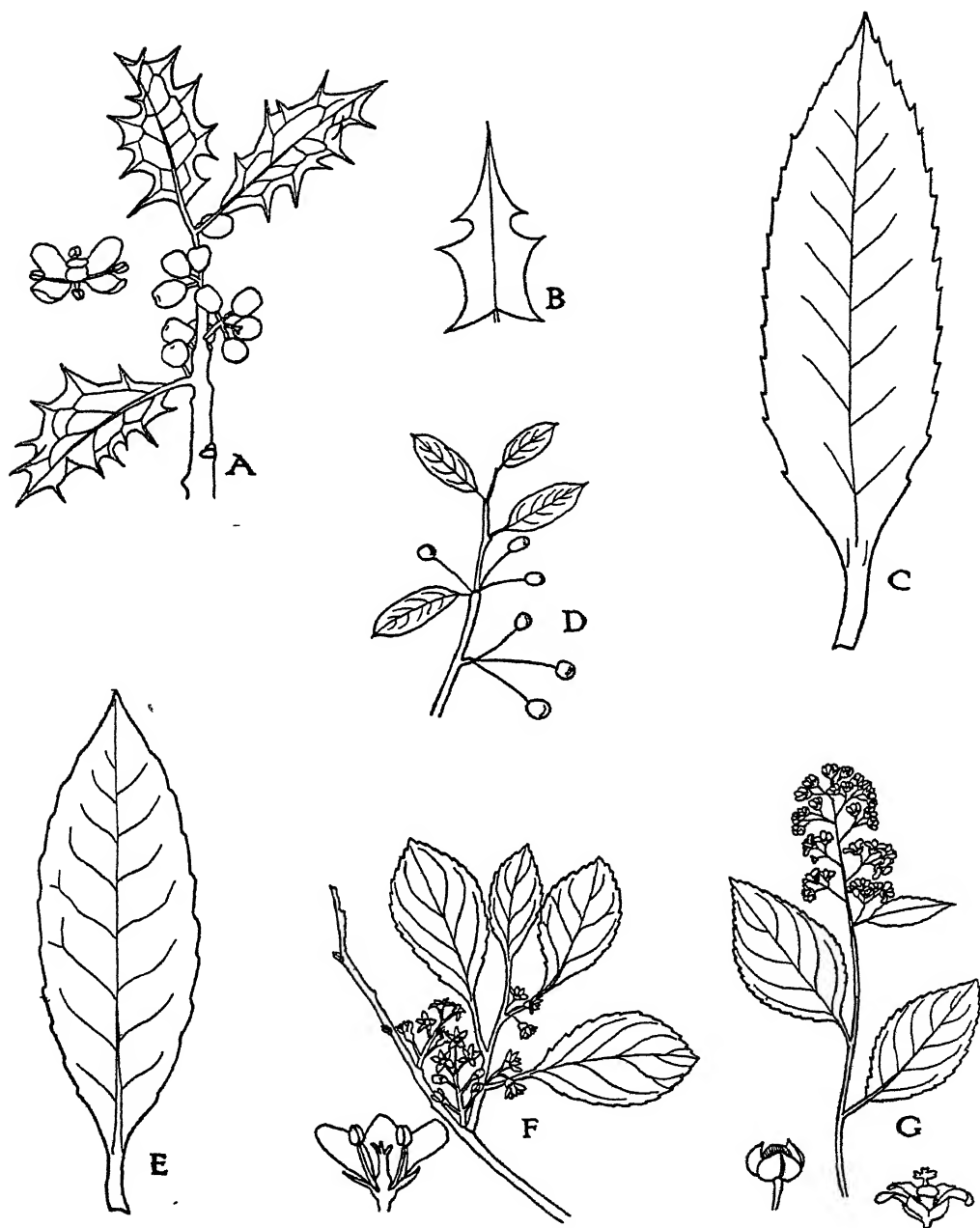


FIG. 85

A. Common Holly, *Ilex aquifolium*

B. *I. Pernyi*

C. Tarajo, *I. latifolia*

H

D. Mountain Holly, *Nemopanthus mucronatus*

E. *Ilex insignis*

F. *Celastrus articulatus*

G. Staff Tree, or Waxwork, *C. scandens*

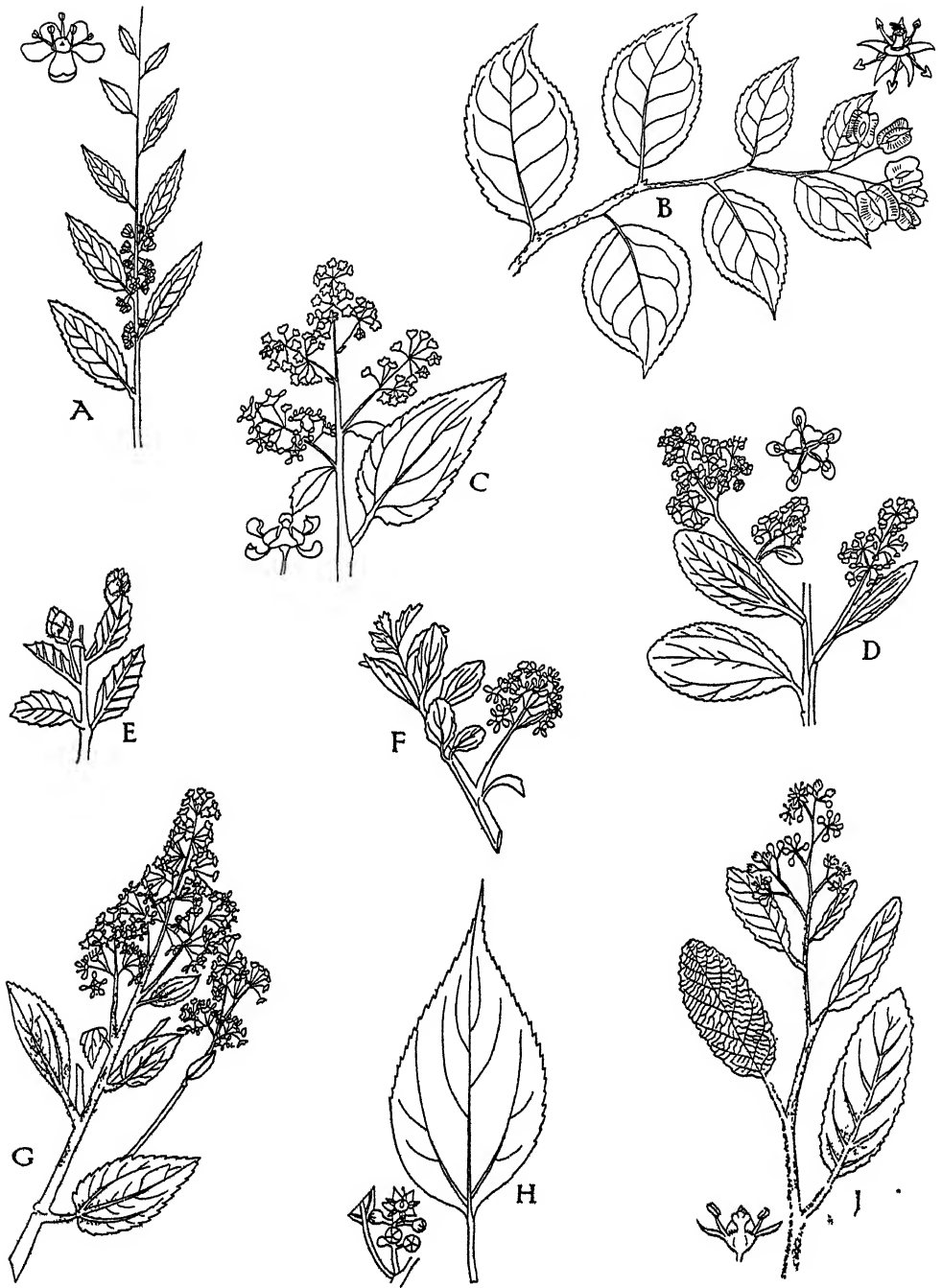


FIG. 86

- A. *Maytenus chilensis*
 B. *Tripterygium Wilfordii*
 C. *New Jersey Tea, Ceanothus americanus*
 D. *Californian Lilac, thyrsiflorus*
 E. *C. dentatus*
 F. *C. Veitchianus*
 G. *G. C. Delilamus*
 H. *Japanese Raisin Tree, Hovenia dulcis*
 I. *Hovenia dulcis*
 J. *Pomaderris elliptica*

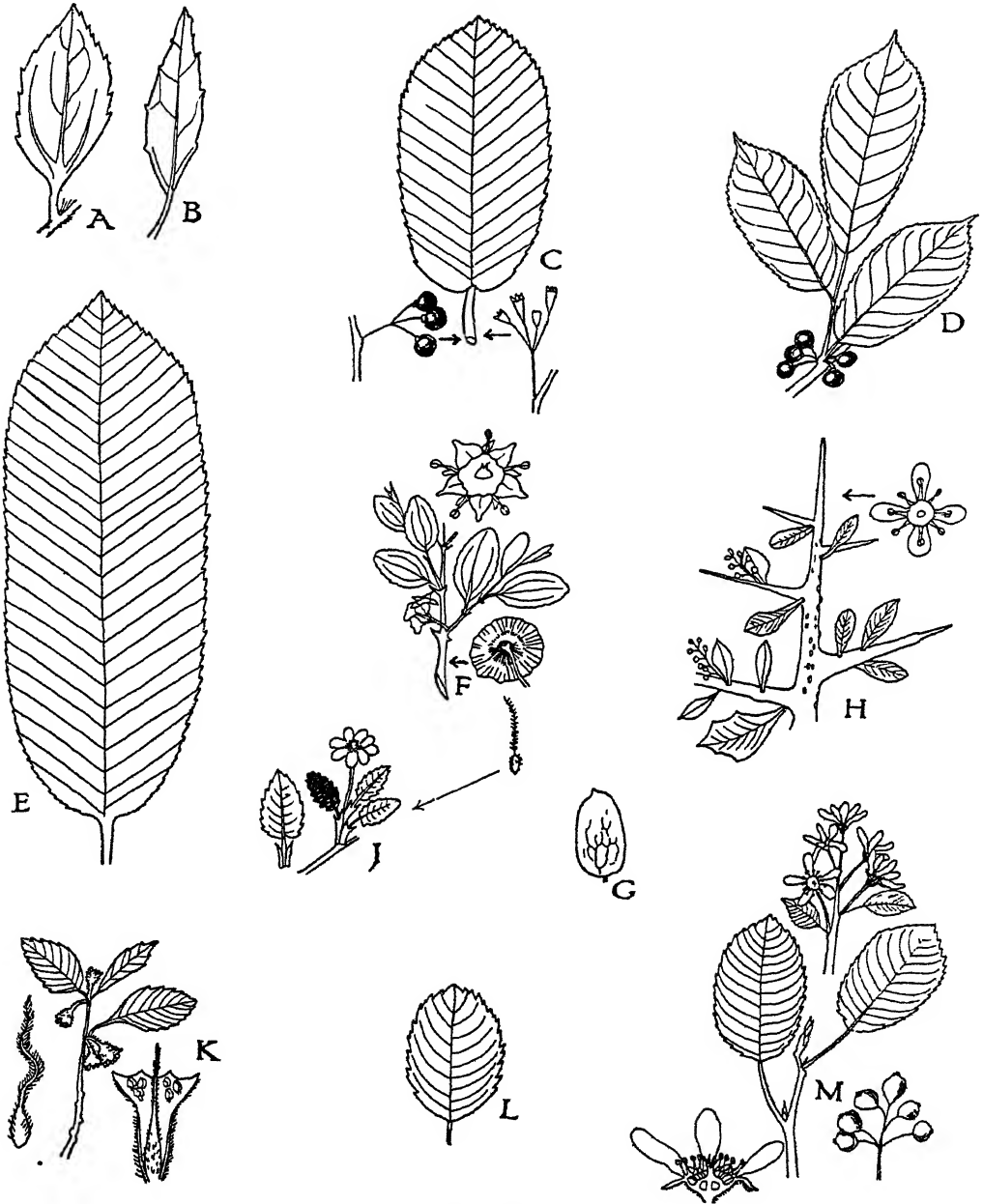


FIG. 87

- A. *Rhamnus Alaternus*
 B. Ditto, variety *angustifolia*
 C. *Cascara Sagrada*, *R. Purshiana*
 D. *R. crenata*
 E. *R. imeretina*

- F. Christ's Thorn, *Palurus Spina-Christi*
 G. Fruit of Jujube, *Zizyphus sativa*
 H. *Schinus dependens*
 J. Mountain Avens, *Dryas octopetala*

- K. Mountain Mahogany, *Cercocarpus parvifolius*
 L. Leaf of Snowy Mespilus, *Amelanchier vulgaris*
 M. June Berry, or Service Berry, *A. canadensis*



FIG 88

- A. Cockspur Thorn, *Crataegus Crus-galli*
 B. *Crataegomespilus grandiflora*
 C. Dwarf Quince, *Cydonia japonica* (*C. Maulei*)
 D. Japonica, *C. lagenaria* (*Pyrus japonica*)
 E *C cathayensis*
 F. Fruit of Chinese Quince, *C. sinensis*
 G. *Pyracantha Rogersiana*
 H. Firethorn, *P. coccinea*
 J. Leaf of *P. Gibbsii*
 K. Loquat, *Eriobotrya japonica*
 L. Medlar, *Mespilus germanica*



FIG. 89

- A. *Raphiolepis japonica*
 B. *Stranvaesia glaucescens*
 C. Chinese Hawthorn,
Photinia serrulata

- D. *P. villosa* (*Pourthiaea*
arguta)
 E. Toyon, or Tollon, *P.*
 (*Heteromeles*) *arbuti-*
folia)

- F. Leaf of *P. Davidsoniae*
 G. Jew's Mallow, *Kerria*
japonica
 H. *Exochorda Albertii*



FIG. 90

A. Cherry Laurel, *Prunus*
Laurocerasus
B. Portugal Laurel, *P. lusitanica*

C. Bird Cherry, *P. Padus*
D. American Wild Red
Cherry, *P. pennsylvanica*

E. Rum Cherry, *P. serotina*
F. Diagram of a raceme

(D and E after Sargent)

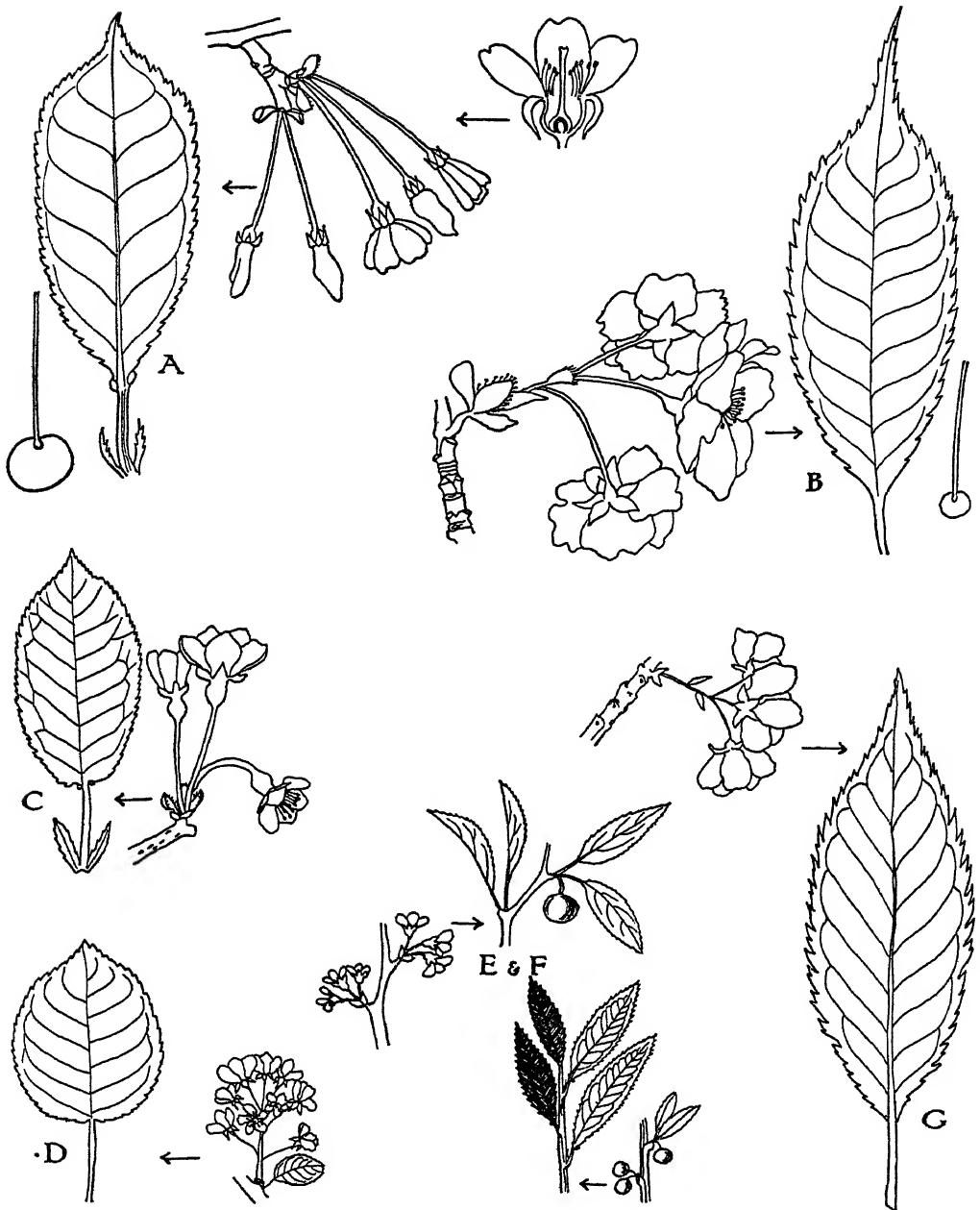


FIG 91

- | | | |
|--|---|---|
| A. Wild Cherry, Gean, or Mazzard, <i>Prunus Avium</i> | C. Wild Dwarf Cherry, <i>P. Cerasus</i> | E. Mountain Cherry, or Chickasaw Plum, <i>P. angustifolia</i> |
| B. Japanese Double-flowered Cherry, <i>P. serrulata</i> , variety <i>flore pleno</i> | D. St. Lucie Cherry, <i>P. Mahaleb</i> | F. Willow Cherry, <i>P. incana</i> |
| | | G. <i>P. Lannesiana</i> |

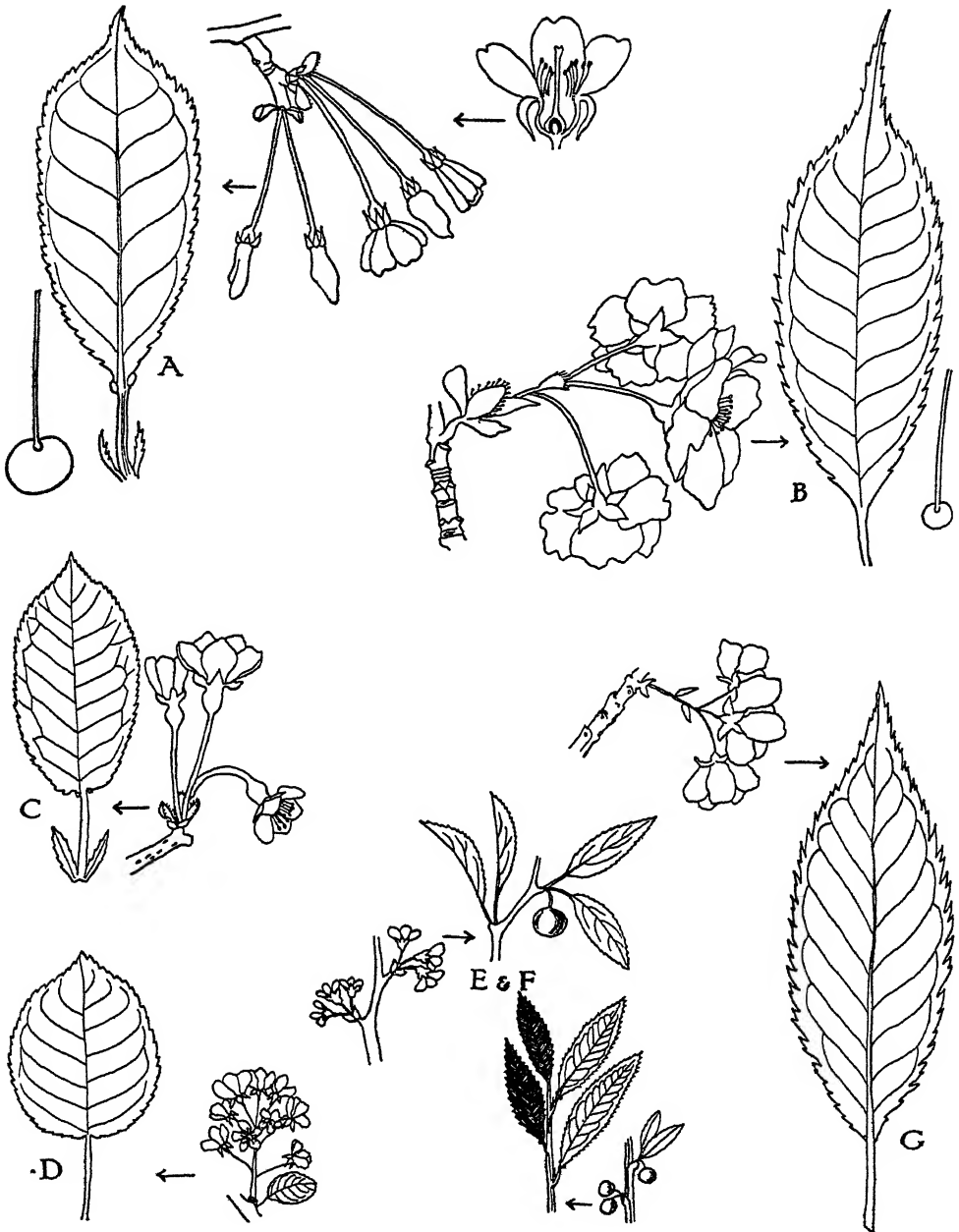


FIG. 91

- A. Wild Cherry, Gean, or Mazzard, *Prunus Avium*
 B. Japanese Double-flowered Cherry, *P. serrulata*, variety *flore pleno*
 C. Wild Dwarf Cherry, *P. Cerasus*
 D. St. Lucie Cherry, *P. Mahaleb*
 E. Mountain Cherry, or Chickasaw Plum, *P. angustifolia*
 F. Willow Cherry, *P. incana*
 G. *P. Lannesiana*

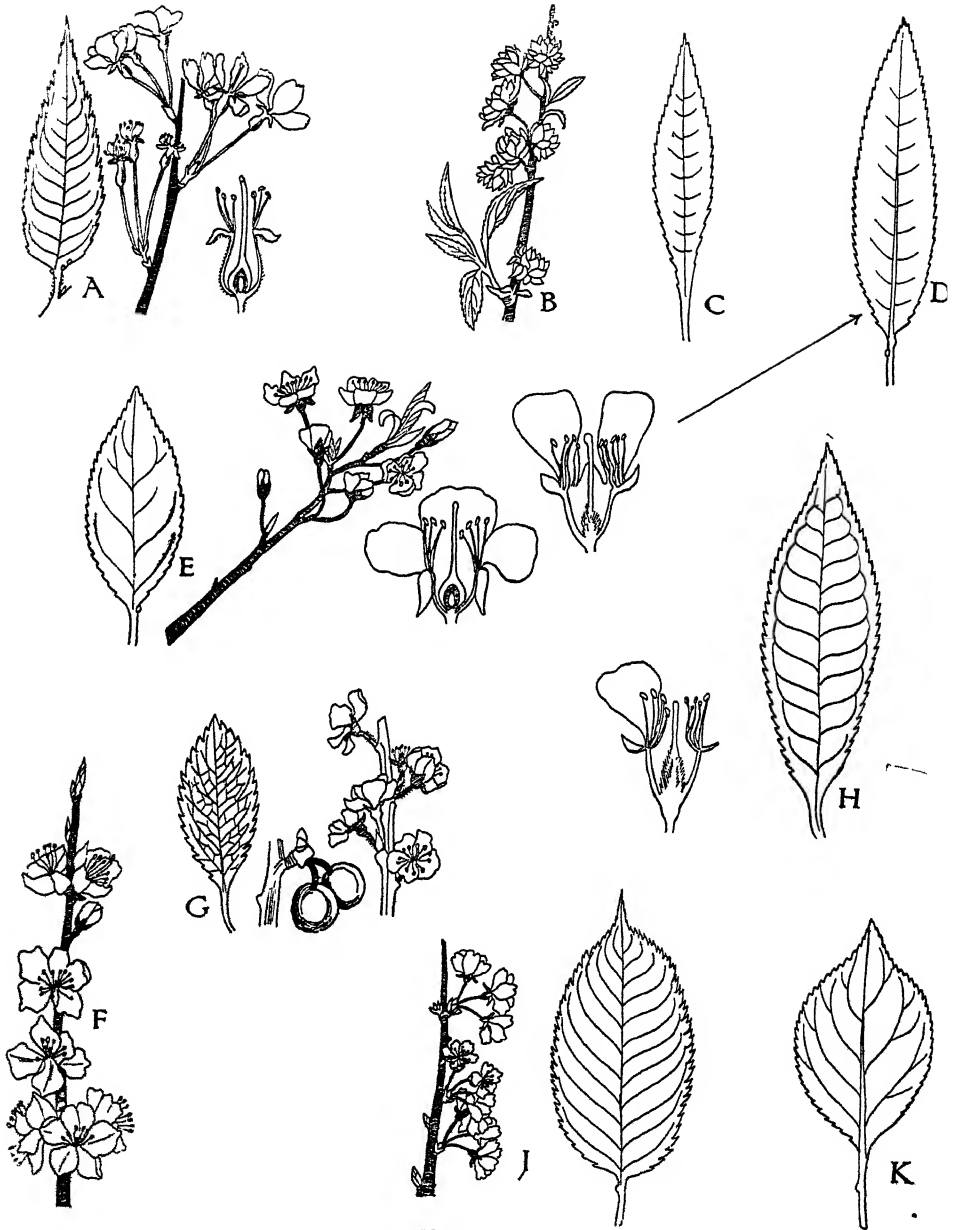


FIG. 92

A. Rosebud Cherry, *Prunus subhirtella*
 B. *P. sinensis*
 C. Leaf of Dwarf Russian Almond, *P. (Amygdalus) nana*

D. Almond, *P. Amygdalus*
 E. Cherry Plum, or Myrobalan, *P. cerasifera*
 F. *P. Davidiana*
 G. Bullace, *P. insititia*

H. Peach, *P. persica*
 J. *P. Conradinae*

K. Leaf of Apricot, *P. Armeniaca*

(F after Robinson, G after Butcher and Strudwick.)

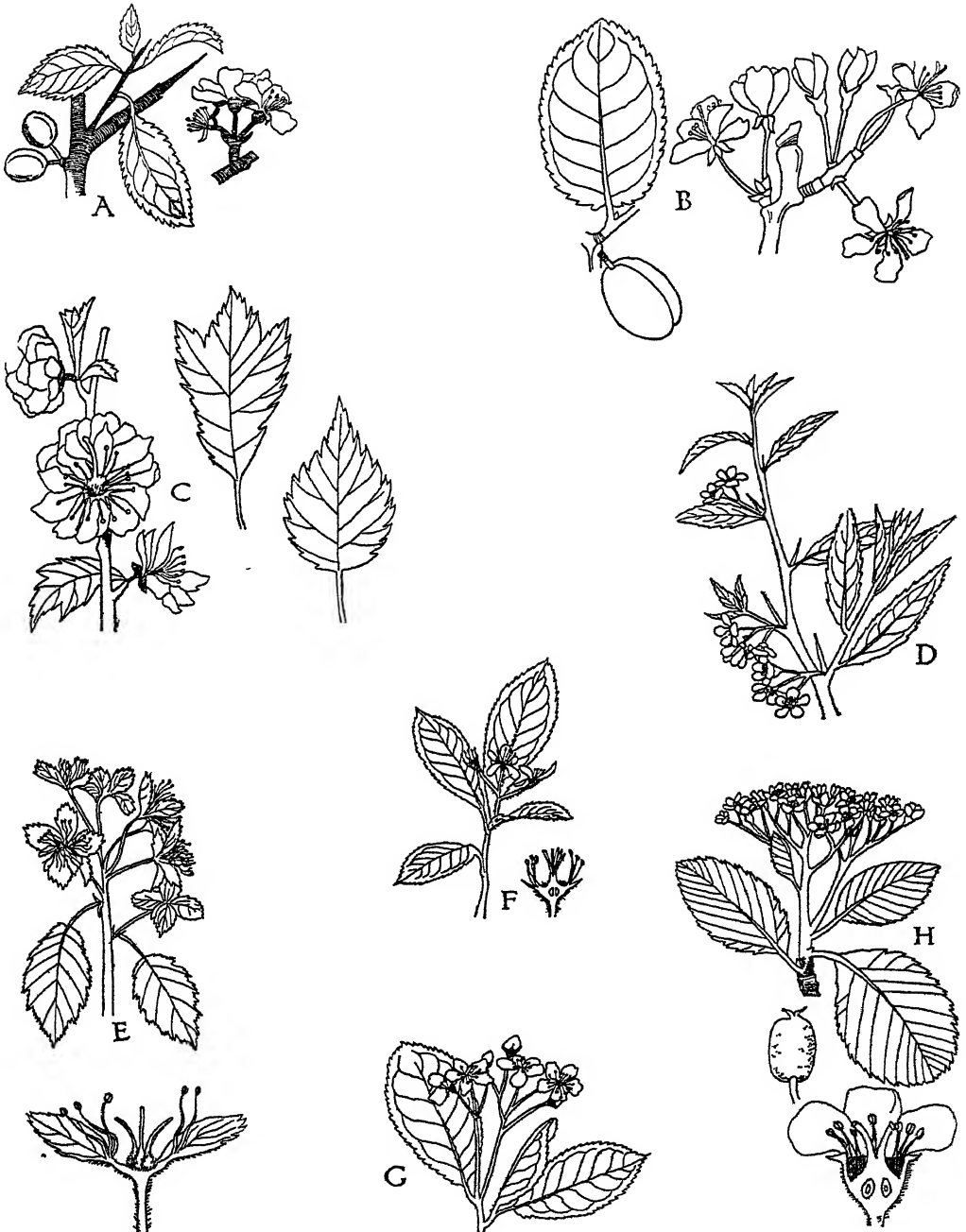


FIG. 93

A. Sloe, or Blackthorn, *Prunus spinosa*

B. Plum, *P. domestica*

C. *P. triloba*

D. *Prinsepia utilis*

E. Snow-in-Summer, *Neviusa alabamensis*

F. Chokeberry, *Aronia arbutifolia*

G. Black Chokeberry, *A. melanocarpa*

H. White Beam, *Sorbus Aria*
(Genus not figured: *Pera-
phyllum*)

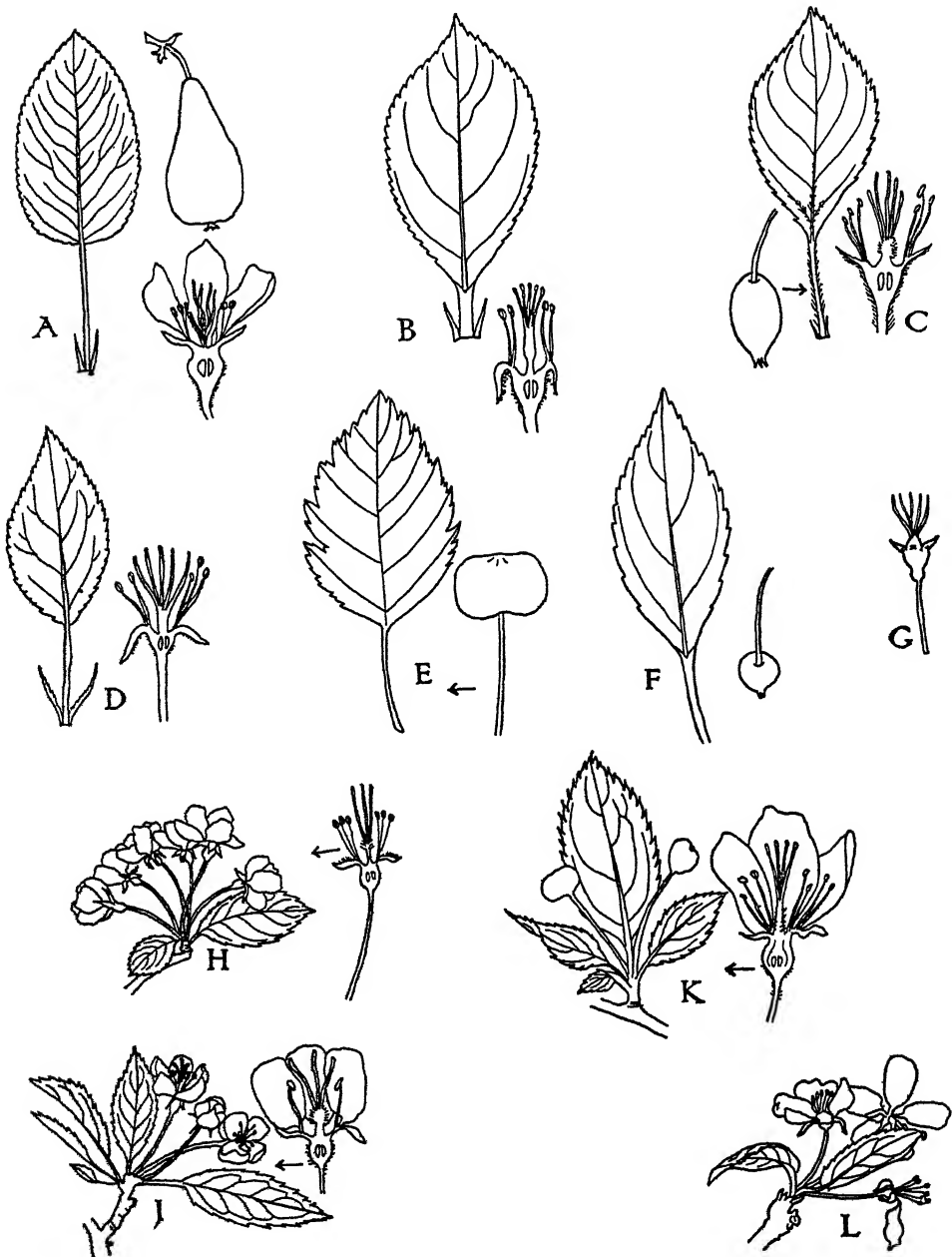


FIG. 94

- A. Pear, *Pyrus communis*
 B. Wild Crab Apple, *Malus pumila*
 C. *M. Eleyi*
 D. Siberian Crab Apple, *M. baccata*

- E. American Crab Apple, *M. coronaria*
 F. *M. purpurea*
 G. Flower of *M. Halliana* after petals and sepals have fallen off

- H. *M. theifera*
 J. *M. Sargentii*
 K. Japanese Crab Apple, *M. floribunda*
 L. *M. Sieboldii* (Tōringo)



FIG. 95

A. *Spiraea arguta*B. *S. canescens*C. Leaf of *S. crenata*D. Leaf of *S. Douglasii*
(flowers similar to E)E. *S. Menziesii*F. Steeplebush, or Hard-
hack, *S. tomentosa*G. *S. Veitchii*H. Bridewort, *S. salicifolia*

(H after Fitch and Smith.)

I. *S. japonica*K. *S. prunifolia*L. *S. media*M. *S. bella*N. *S. Van Houttei*

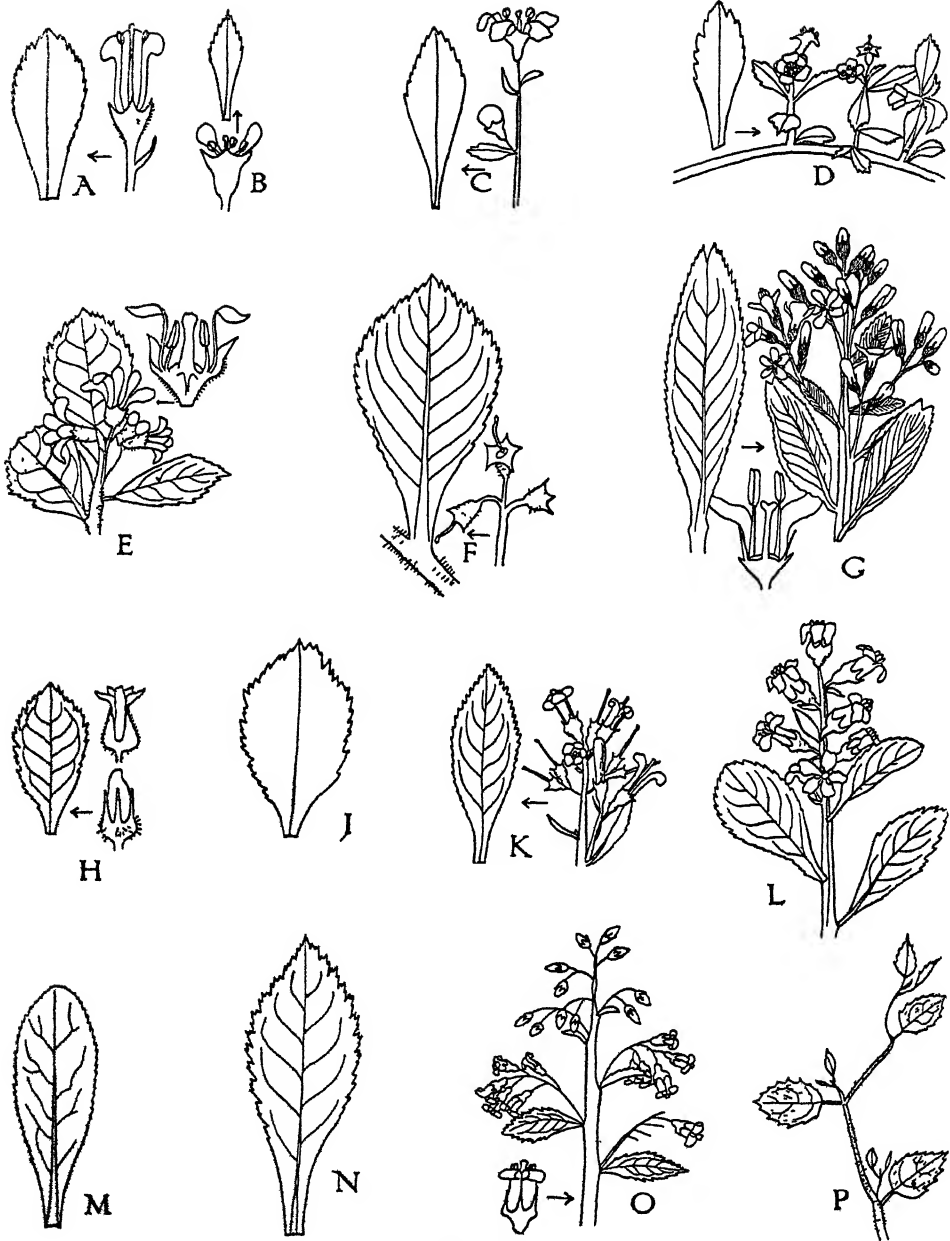


FIG. 96

A. *Escallonia exoniensis*
 B. *E. Philippiana*
 C. *E. ednensis*
 D. *E. langleyensis*
 E. *E. Ingrami*

F. *E. macrantha*
 G. *E. montevidensis*
 H. *E. rubra*
 J. *E. revoluta*
 K. *E. illimita*

L. *E. Iveyi*
 M. *E. viscosa*
 N. *E. pulverulenta*
 O. *E. pterocladon*
 P. *Carpodetus serratus*

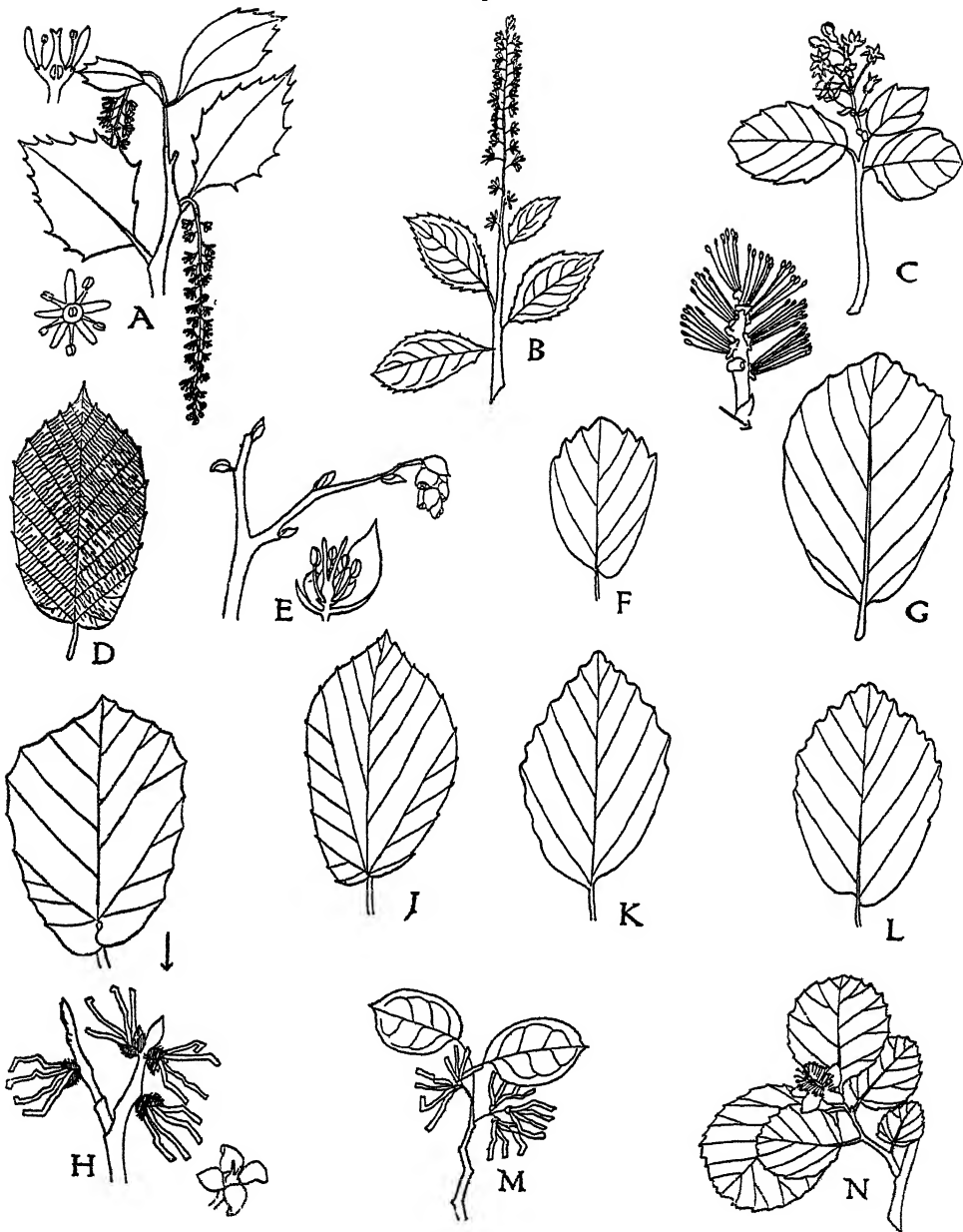


FIG. 97

- | | | |
|--|---|--|
| A. <i>Itea ilicifolia</i> | F. Leaf of <i>Fothergilla alnifolia</i> | K. <i>H. vernalis</i> |
| B. <i>I. virginica</i> | G. <i>F. major</i> | L. Virginian Witch Hazel, <i>H. virginiana</i> |
| C. <i>Ribes viburnifolium</i> | H. Chinese Witch Hazel, <i>Hamamelis mollis</i> | M. <i>Loropetalum chinense</i> |
| D. Leaf of <i>Corylopsis Willmottiae</i> | J. Leaf of Japanese Witch Hazel, <i>H. japonica</i> | N. <i>Parrotiopsis (Parrotia) jacquemontiana</i> |
| E. Flowering twig of C. <i>spicata</i> | | |
- (N after Brandis.)



FIG 98

- A. *Sinowilsonia Henryi*
 B. Iron Tree, *Parrotia persica*
 C. *Sycopsis sinensis*
 D. Gutta-percha Tree, *Eucommia ulmoides*

- E Californian Fuchsia, *Zauschneria californica*
 F. *Fuchsia excorticata*
 G. Leaf of *Helwingia japonica* (Genus not figured: *Fortunearia*)
 H. *Microglossa albescens*
 J. Bract Tree, *Davidia vilmoriniana*

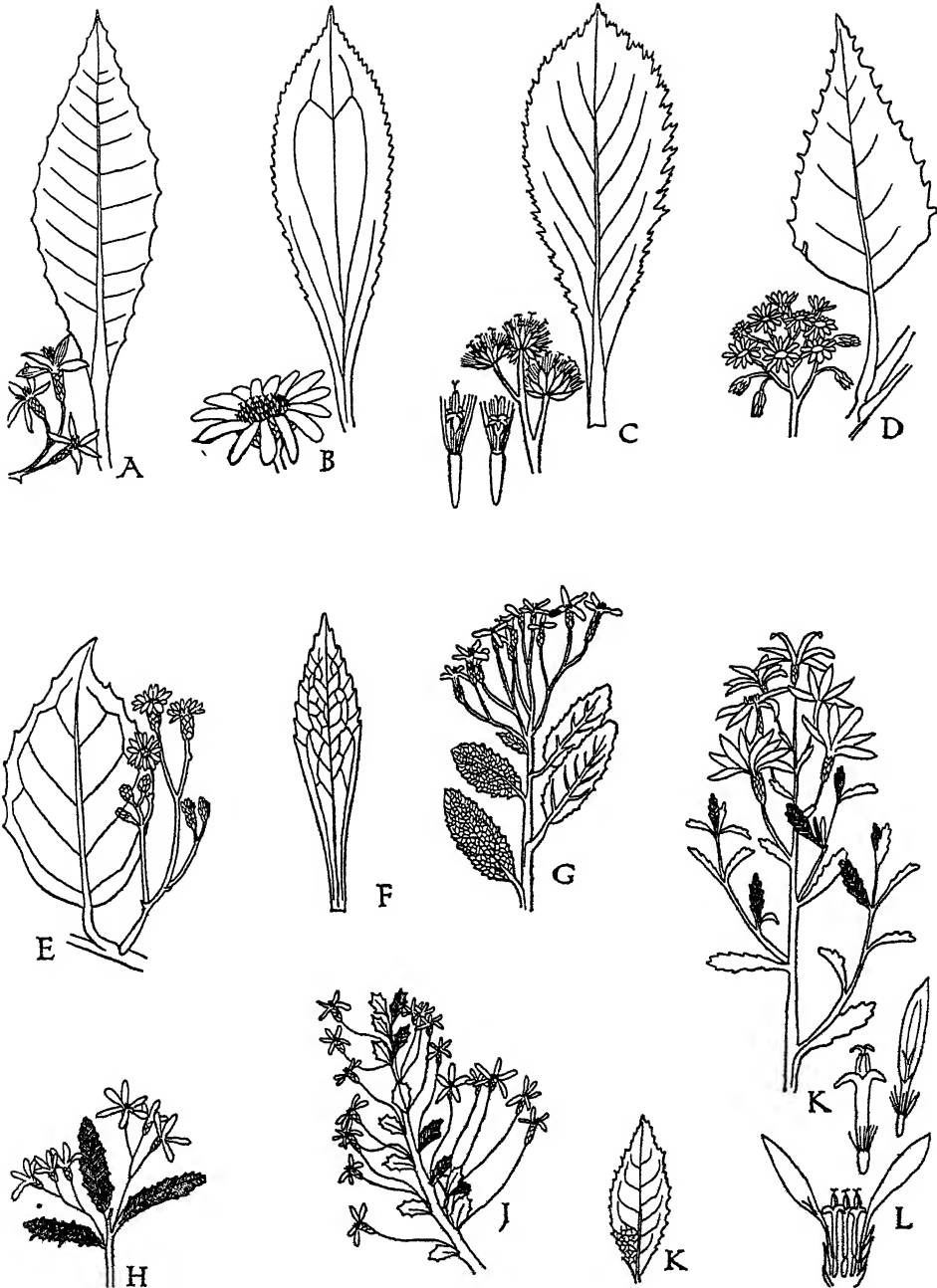


FIG. 99

A *Olearia argophylla*
 B. *O. chathamica*
 C. *O. Colensoi*
 D. *O. macrodonta*

E. *O. nitida*
 F. Leaf of *O. semidentata*
 G. *O. speciosa*

H-K. Three forms of *O. erubescens*
 L. *O. Gunniana* (*O. stellulata*)

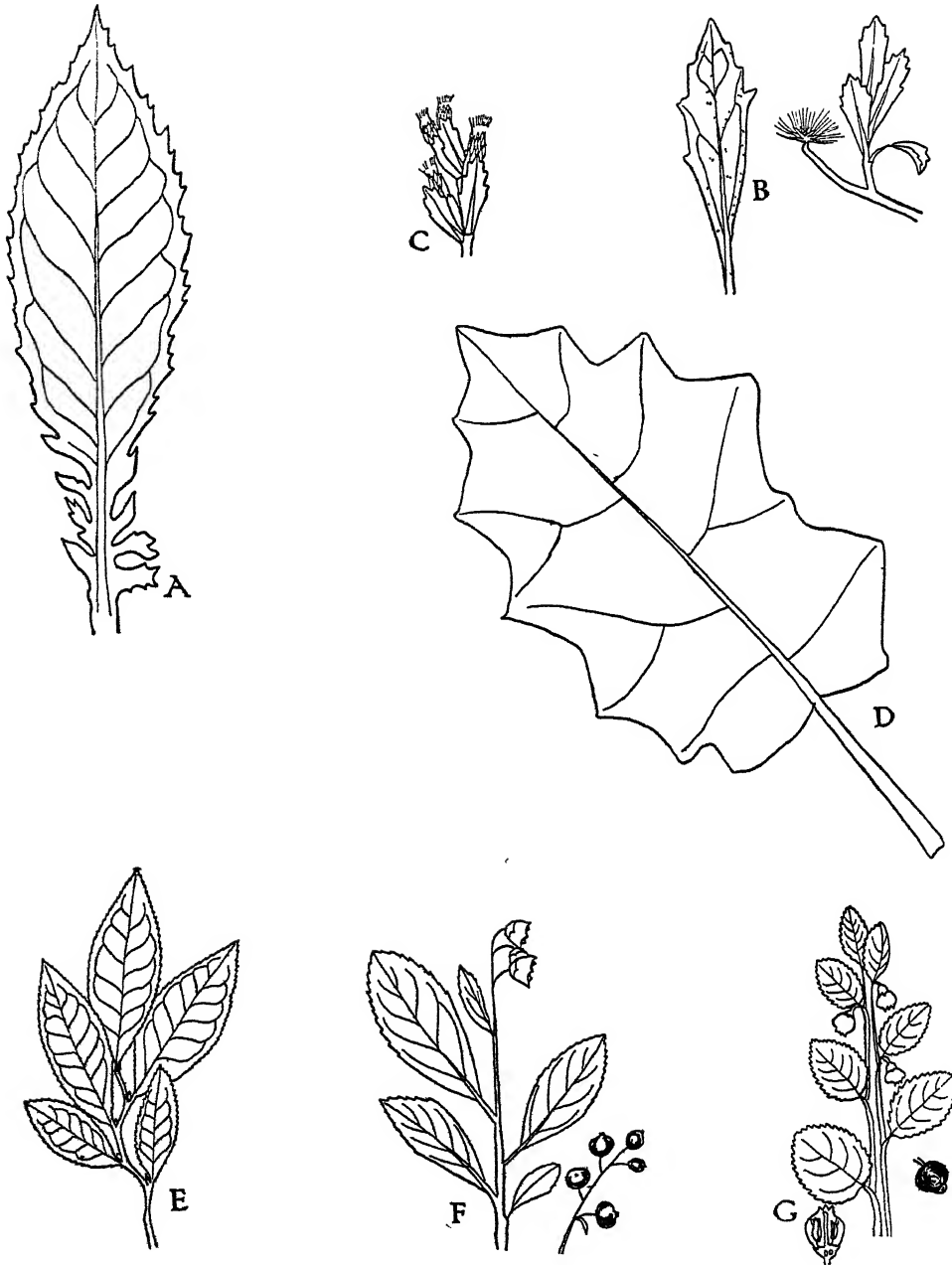


FIG. 100

A. Leaf of *Senecio Hectori*D. Leaf of *Brachyglottis repanda*F. Farkleberry, *Vaccinium arboreum*B. Groundsel Tree, *Baccharis halimifolia*E. Shoot of Box Huckleberry, *Gaylussacia brachycera* (F after Sargent.)G Whortleberry, or Bilberry, *V. Myrtillus* (Genus not figured: *Grindelia*)C. *B. patagonica*

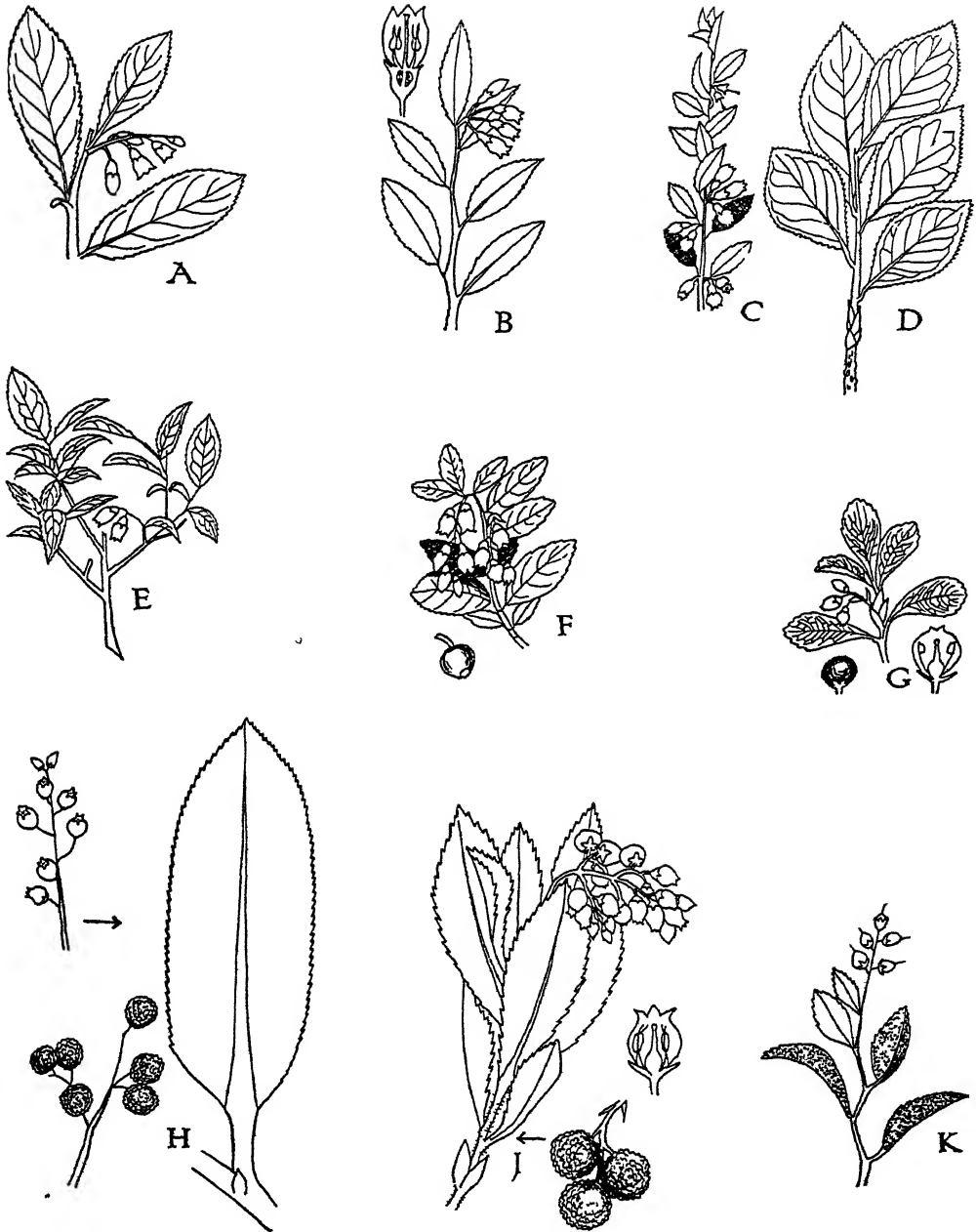


FIG. 101

A. Caucasian Whortleberry,
Vaccinium Arctostaphylos

B. *V. ovatum*

C. Mortina, *V. Mortinia*

D. *V. glauco-album*

E. Low Blueberry, *V. pennsylvanicum*

F. Cowberry, *V. Vitis-idaea*

G. Black Bearberry, *Arc-tious alpinus*

H. Madrona, *Arbutus Men-ziesii*

J. Strawberry Tree, *A. Unedo*

K. Leather Leaf, *Cassandra calyculata*

(G after Butcher and Strudwick.)

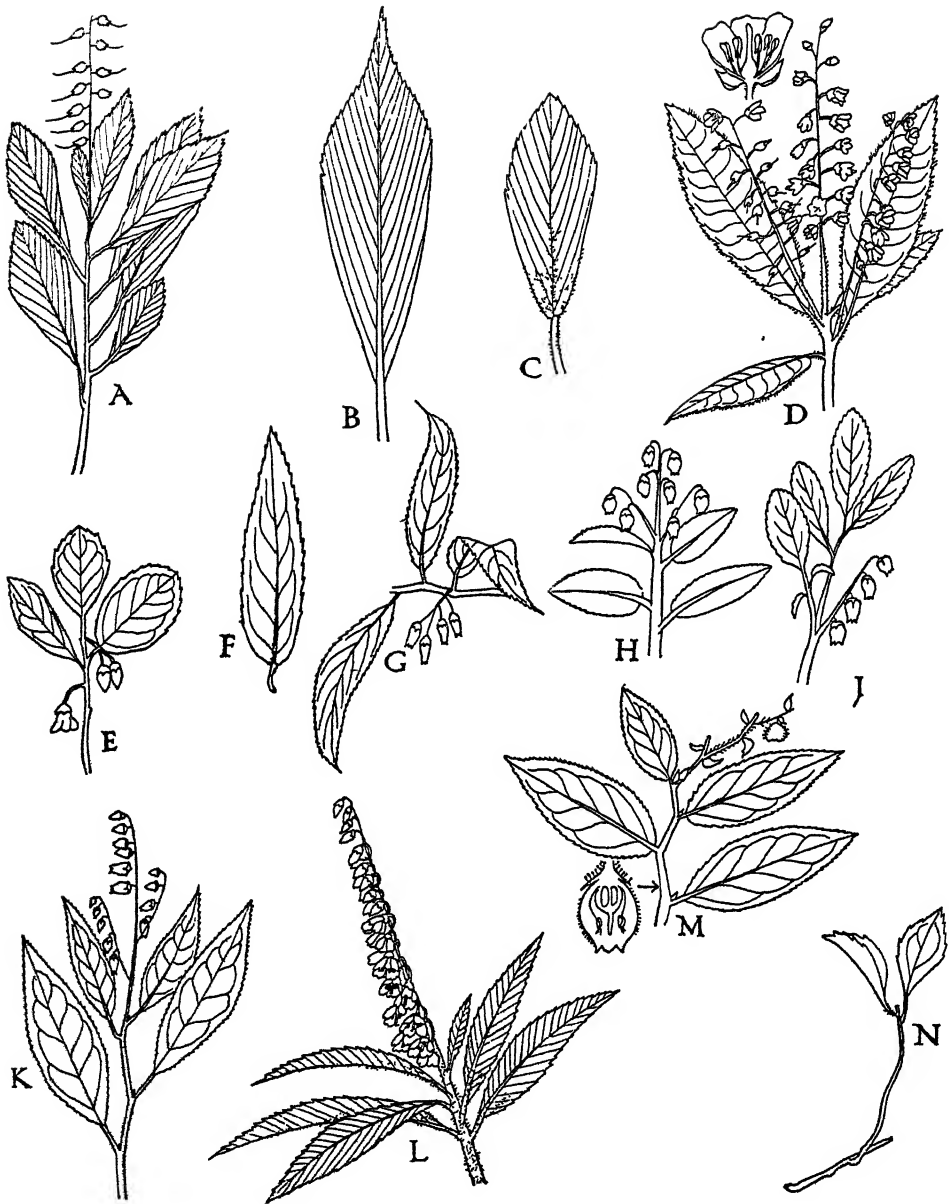


FIG. 102

- | | | |
|--|---|---|
| A. Sweet Peppermint,
<i>Clethra alnifolia</i> | E. May Flower, <i>Epigaea</i>
<i>repens</i> | K. <i>Oxydendrum arboreum</i> |
| B. White Alder, <i>C. acumi-</i>
<i>nata</i> | F. Leaf of <i>Leucothoe axil-</i>
<i>laris</i> | L. <i>Clethra Delavayi</i> |
| C. <i>C. tomentosa</i> | G. <i>L. Catesbaei</i> | M. Shallon, <i>Gaultheria</i>
<i>Shallon</i> |
| D. Lily-of-the-Valley Tree,
<i>C. arborea</i> | H. <i>L. Davisiae</i> | N. Shoot of Creeping Win- |
| | J. <i>L. racemosa</i> | tergreen, <i>G. procum-</i>
<i>bens</i> |

(G-J after Bean, L after a photograph.)



FIG. 103

A. Prickly Heath, *Pernettya mucronata*

B. *Zenobia pulverulenta*

C. *Pieris japonica*

D. *P. formosa*

E. *P. floribunda*

F. *Myrsine africana*

G. *Ardisia japonica*

H. Globe Daisy, *Globularia cordifolia*

I. *Symplocos paniculata*

(J after Collett.)



FIG. 104

A. Snowdrop Tree, or Silver Bell Tree, *Halesia carolina*

B. *H. diptera*

C. *H. monticola*

D. Epaulette Tree, *Pterostyrax hispida*

E. *Styrax Obassia*

F. American Storax, *S. americanum*

G. *S. japonicum*

H. Leaf of *Lomatia obliqua*

J. Mountain Spurge, *Pachysandra terminalis*

K. Alleghany Spurge, *P. procumbens*

L. *Ehretia acuminata*

(Fruits of B and C after Sargent.)

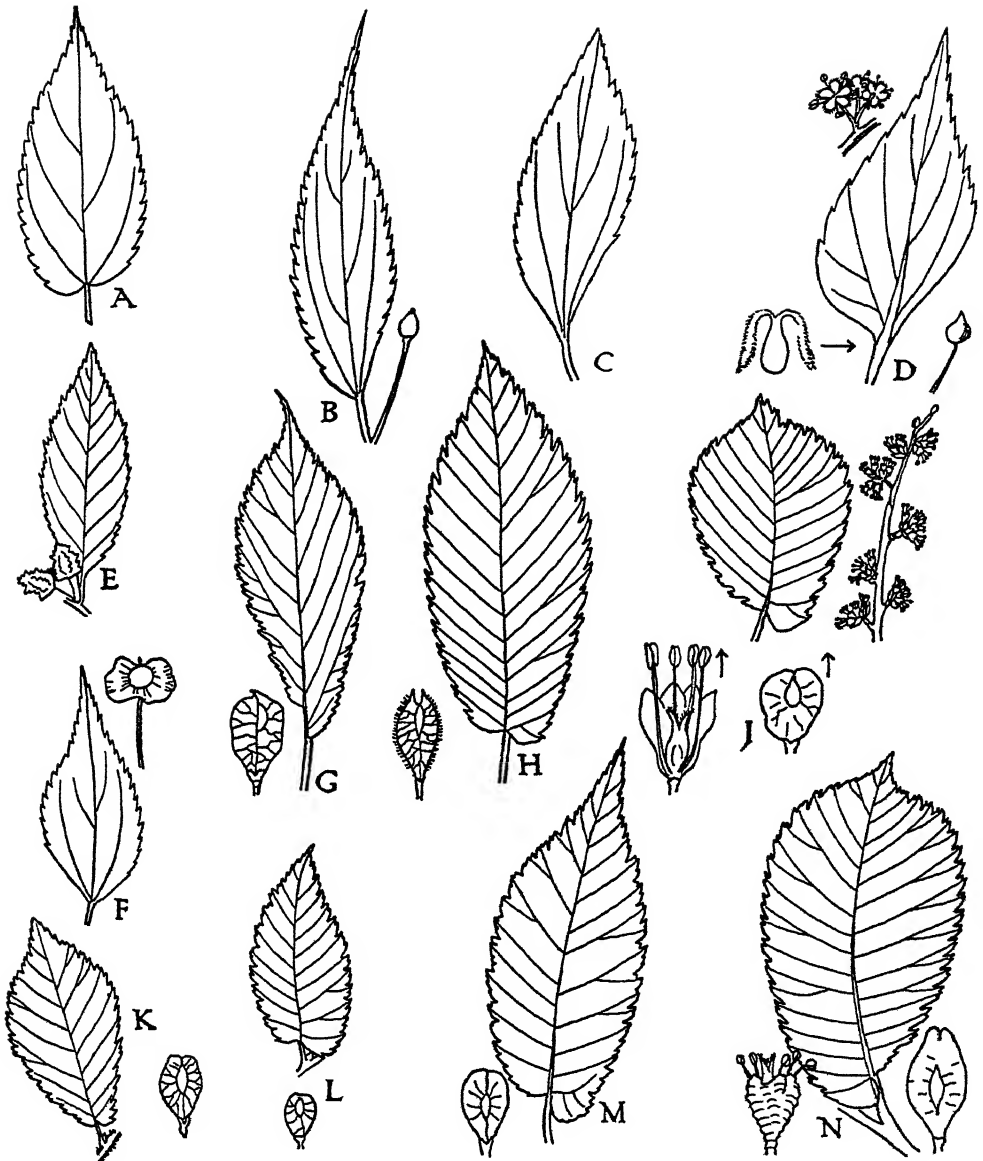


FIG. 105

A. *Aphananthe aspera*

B-D Nettle Trees:

B. *Celtis australis*C. *C. caucasica*D. Sugarberry, or Hackberry, *C. occidentalis*E. Water Elm, *Planera aquatica*F. *Pteroceltis Tatarinowii*G. Smooth-leaved or Feathered Elm, *Ulmus nitens*H. American or White Elm, *U. americana*J. Common English Elm, *U. campestris*K. Cornish Elm, *U. stricta*L. East Anglian or Lock Elm, *U. minor*M. Huntingdon or Chichester Elm, *U. vegeta*N. Wych Elm, *U. montana*

(H after Sargent, G and K-M after Moss and Hunnybun.)

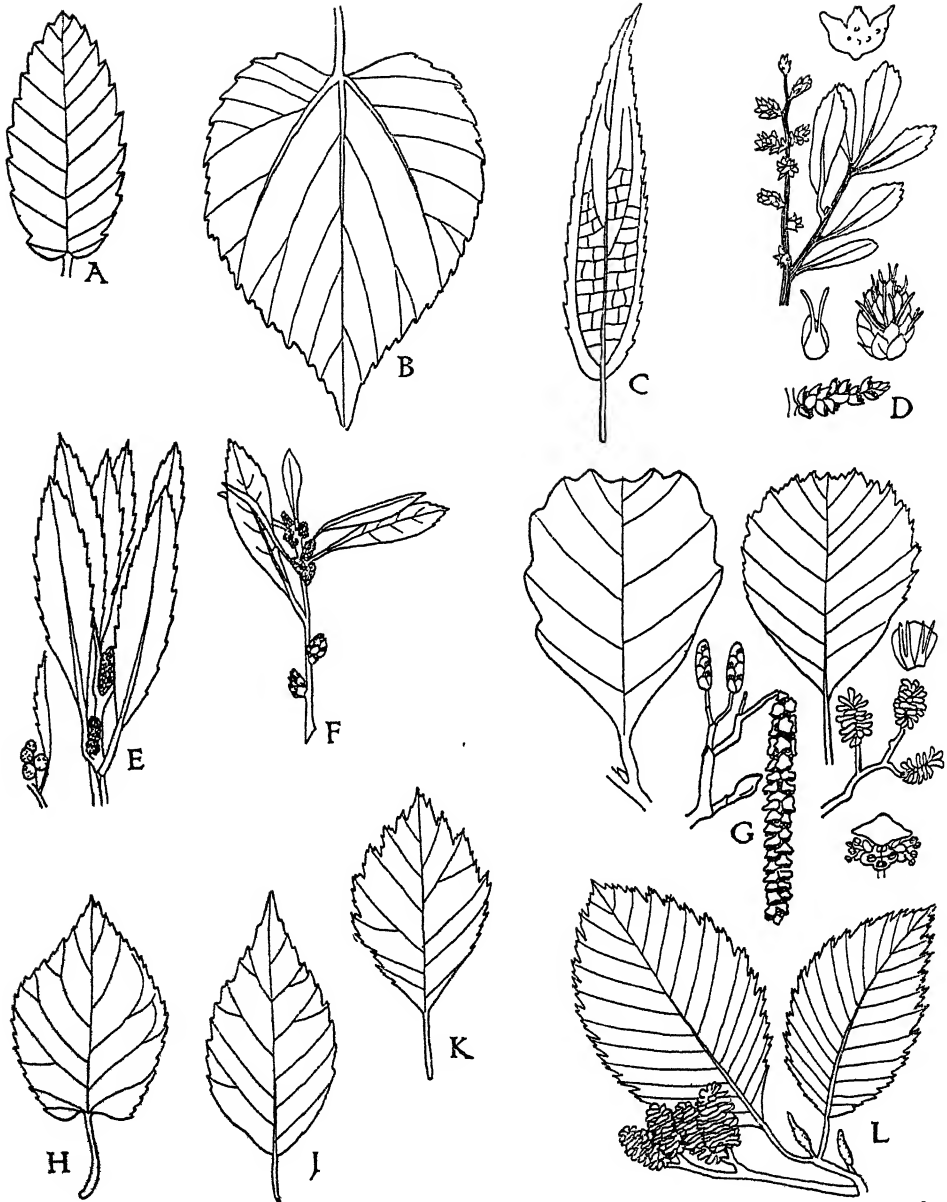


FIG. 106

A. *Zelkova crenata*B. Common Mulberry,
Morus nigra (for
flowers and fruits see
Fig. 28 F)C. *Debregeasia velutina*D. Sweet Gale, or Bog
Myrtle, *Myrica Gale*E. Californian Wax Myrtle,
*M. californica*F. Wax Myrtle, *M. cerifera*G. Common Alder, *Alnus*
*glutinosa*H. Italian Alder, *A. cordata*J. Himalayan Alder, *A.*
*nitida*K. Grey Alder, *A. incana*L. Oregon Alder, *A. oregona*

(L after Sargent.)



FIG. 107

- A. Dwarf Birch, *Betula nana*
 B. Silver Birch, *B. verrucosa*
 C. White Birch, *B. pubescens*
 D. Yellow Birch, *B. lutea*
 E. River or Red Birch, *B. nigra*
 F. *B. Maximowicziana*
 G. Paper or Canoe Birch, *B. papyrifera*
 H. Himalayan Birch, *B. utilis*
 I. Common Hornbeam, *Carpinus Betulus*
 J. American Hornbeam, *C. caroliniana*
 K. American Hornbeam, *C. caroliniana*
 L. Hop Hornbeam, *Ostrya virginiana*

(A after Moss and Hunnybun, D, E, G, and fruits of K and L after Sargent, H after Brandis.)



FIG. 108

- | | | |
|---------------------------------|-----------------------------|---------------------------------------|
| A. Common Hazel, <i>Corylus</i> | D. Sweet or Spanish Chest- | F. <i>Ostryopsis</i> <i>Davidiana</i> |
| <i>Avellana</i> | nut, <i>Castanea sativa</i> | G. <i>Nothofagus</i> <i>Dombeyi</i> |
| B. Fruit of Turkish Hazel, | | E. Common Beech, <i>Fagus</i> |
| <i>C. Colurna</i> | | <i>sylvatica</i> |
| C. Filbert, <i>C. maxima</i> | | H. Encena, or Live Oak, |
| | | <i>Quercus agrifolia</i> |

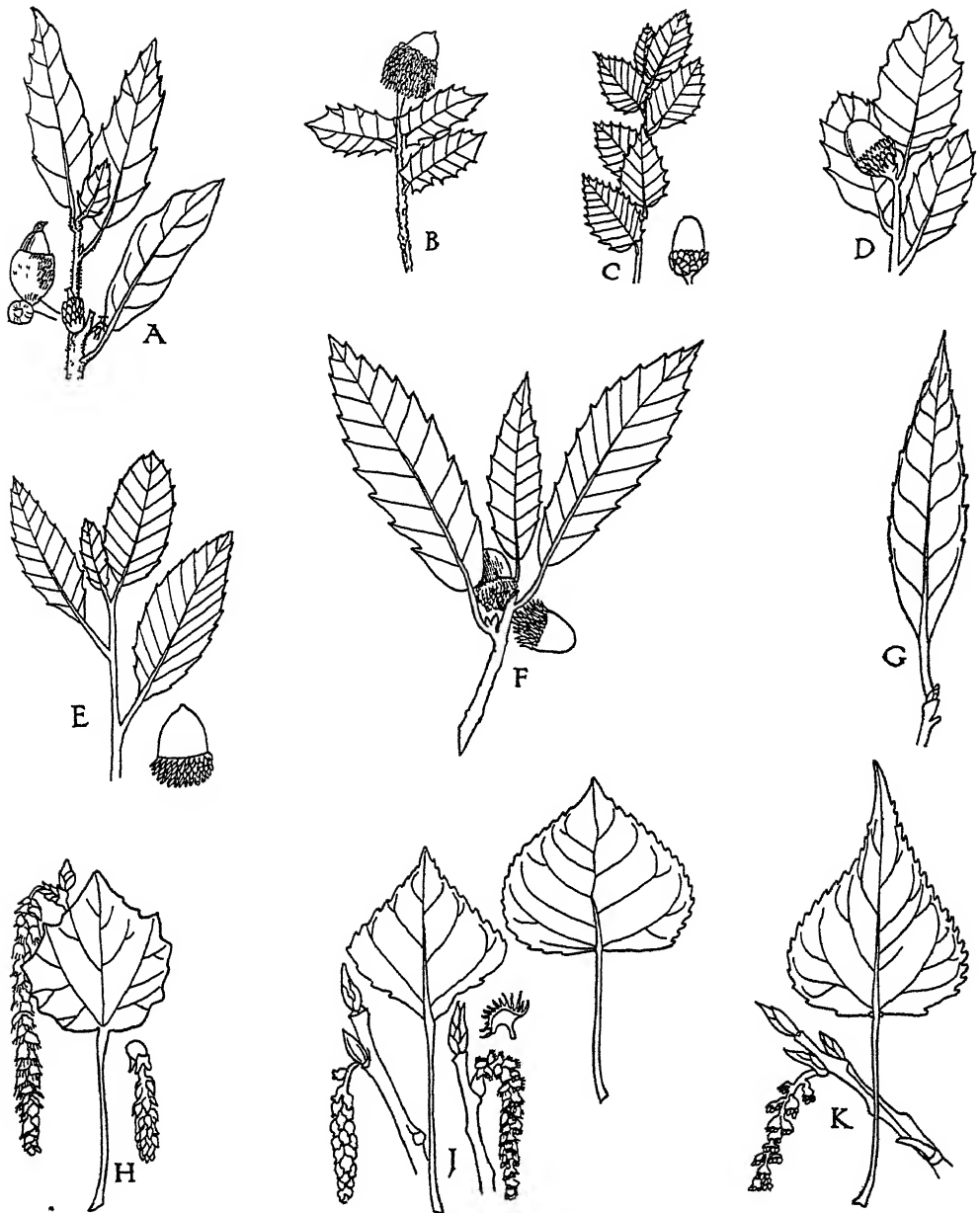


FIG. 109

A. Common Evergreen Oak, or Holm Oak, *Quercus ilex*

B. Kermes Oak, or Grain Tree, *Q. coccifera*

C. Maul Oak, *Q. chrysolepis*

D. Cork Oak, *Q. Suber*

E. Tanbark Oak, *Q. densiflora*

F. Chestnut-leaved Oak, *Q. castaneaefolia*

G. Bamboo-leaved Oak, *Q. myrsinaefolia*

H. Grey Poplar, *Populus canescens*

J. Black Poplar, *P. nigra*

K. Black Italian Poplar, *P. serotina*

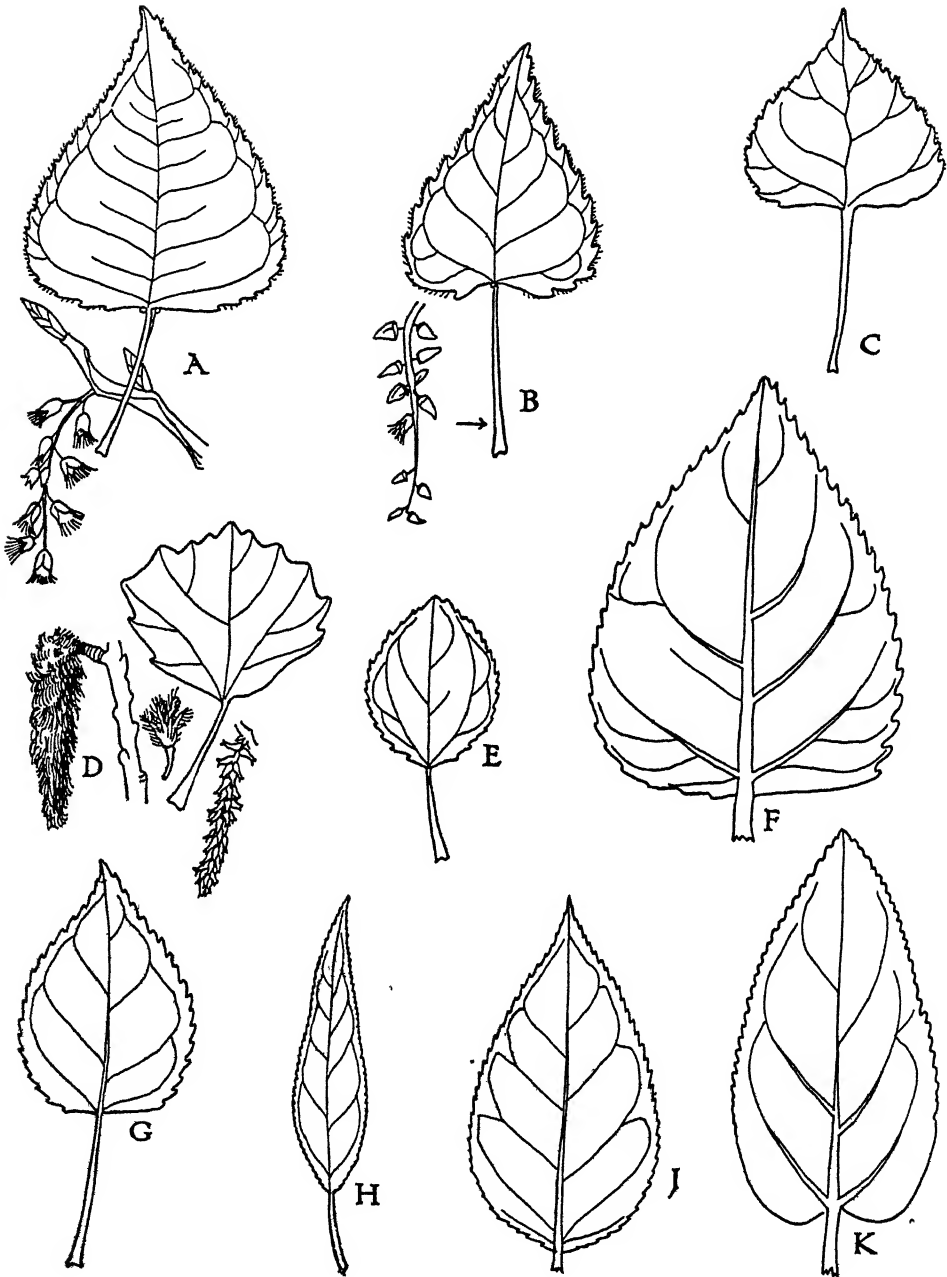


FIG. 110

A. Carolina Poplar, *Populus angulata*
 B. Canadian Black Poplar, or Necklace Poplar, *P. monilifera*
 C. *P. Eugenei*

D. Aspen, *P. tremula*
 E. American Aspen, *P. tremuloides*
 F. *P. generosa*
 G. Balsam Poplar, *P. canadensis*

H. Willow-leaved Poplar, *P. angustifolia*
 I. Black Cottonwood, *P. trichocarpa*
 K. *P. szechuanica*



FIG. III

- | | | |
|---|--|--|
| A. White Willow, <i>Salix alba</i> | F Whortle Willow, <i>S. myrsinites</i> | L Weeping Willow, <i>S. babylonica</i> |
| B. <i>S. Arbuscula</i> | G. Tea-leaved Willow, <i>S. phylicifolia</i> | M. Pussy Willow, <i>S. discolor</i> |
| C. Round-eared Willow, <i>S. aurita</i> | H. Grey Willow, <i>S. cinerea</i> | N. Dark-leaved Sallow, <i>S. nigricans</i> |
| D. Goat Willow, or Sallow, <i>S. Caprea</i> | J. Bay Willow, <i>S. pentandra</i> | O. <i>S. Andersomana</i> |
| E. Crack Willow, <i>S. fragilis</i> | K. Almond-leaved Willow, <i>S. triandra</i> | P. Violet Willow, <i>S. daphnoides</i> |

(B and O after Butcher and Strudwick, E and N after Moss and Hunnybun.)

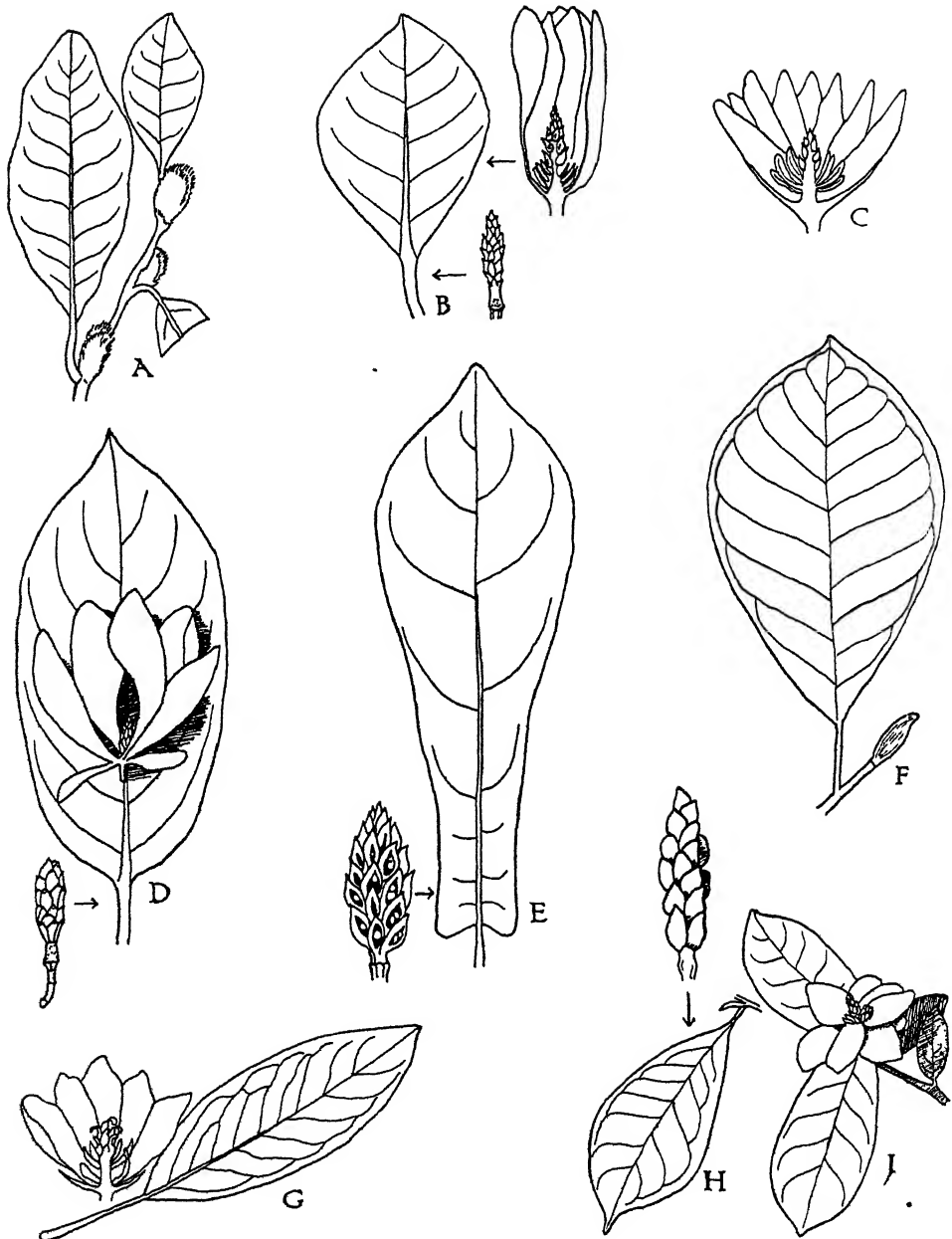


FIG. 112

- A. Yulan, or Lily Tree, *Magnolia conspicua*
 B. *M. soulangeana*
 C. Flower of *M. stellata*
 D. Cucumber Tree, *M. acuminata*
 E. *M. fraseri*
 F. *M. obovata*
 G. Laurel Magnolia, Swamp Bay, or Beaver Tree, *M. glauca*
 H. *M. kobus*
 J. *M. parviflora*

(D and E after Sargent.)

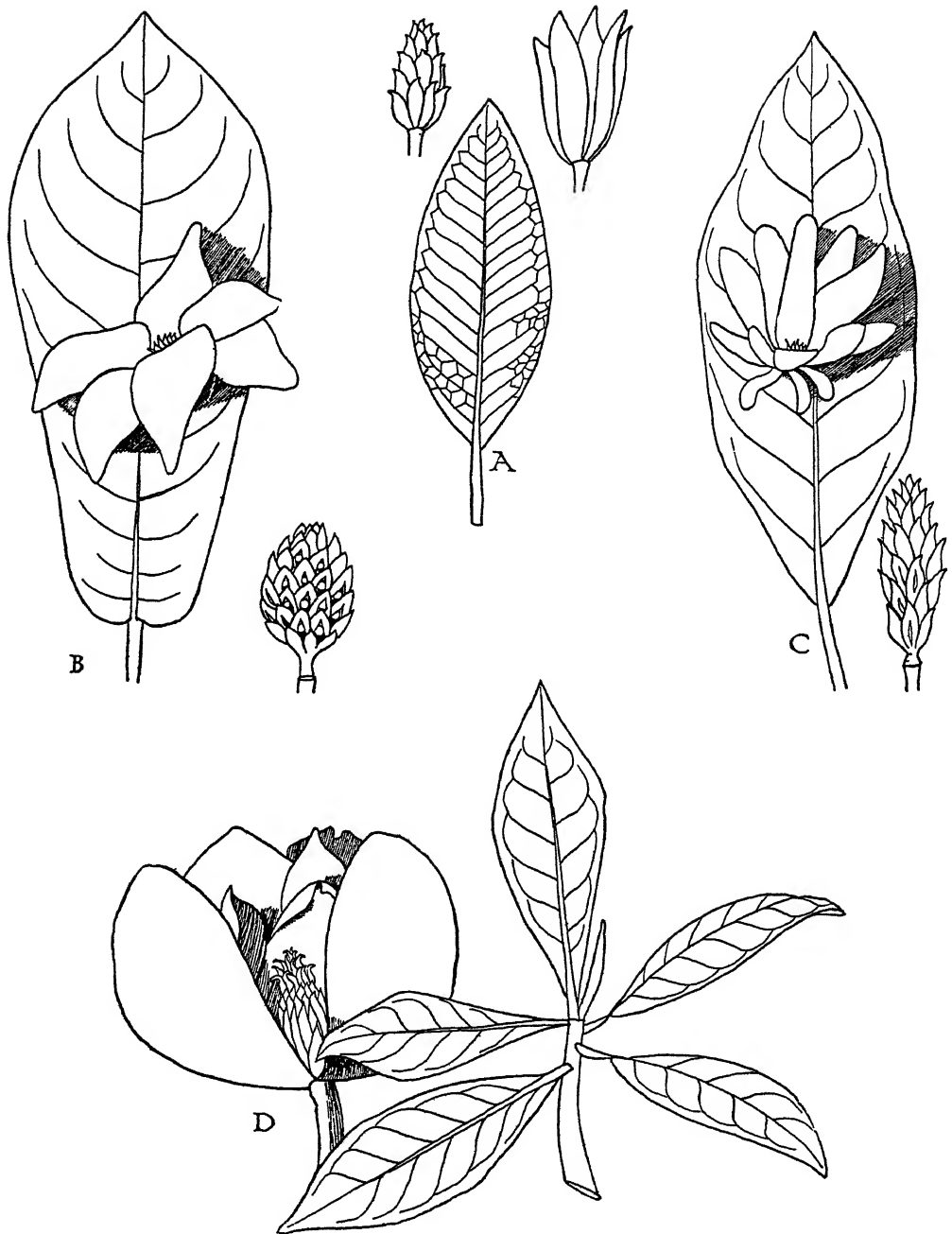


FIG. 113

A. *Manglietia insignis*
 B. Large-leaved Cucumber Tree,
Magnolia macrophylla

C. Umbrella Tree, *M. tripetala*
 D. Bull Bay, *M. grandiflora*

(B and C after Sargent.)



FIG. 114

- A. Banana Shrub, *Michelia fuscata*
 B. *M. compressa*
 C. Anise, *Illicium anisatum*
 D. *I. floridanum*

- E. *Drimys aromatica*
 F. Winter's Bark, *D. Winteri*
 G. Leaf of Californian Tree
 Poppy, *Dendromecon rigidum*

- H. *Cocculus laurifolius*
 J. Carolina Moonseed, *C. carolinus*
 K. Pawpaw, *Asimina triloba*

(Fruit and flower of K after Sargent.)



FIG. 115

A. Gold Dust, or Golden Tuft, *Alyssum saxatile*

B. Purple Apple Berry, *Billardiera longiflora*

C. *Pittosporum Tobira*

D. *P. crassifolium*

E. Cress Rocket, *Pseudocytisus*

F. *Alyssum spinosum*

G. Australian Bluebell Creeper, *Sollya heterophylla*

Vella

Ga Flower of ditto

H. *Hymenanthera crassifolia*

J. Milkwort, *Polygala Chamaebuxus*

K. *Podalyria sericea*

L. *Pittosporum undulatum*

M. *P. pauciflorum*



FIG. 116

A. *Pittosporum eugenoides*B. *P. tenuifolium*C. *P. revolutum*D. Kangaroo Thorn, *Acacia armata*E. *Eurya ochnacea*F. *Orixa japonica*G. *Cleyera Fortunei*H. *Skimmia japonica*J. *S. Laureola*

(J after Collett.)



FIG. 117

- A. Holly, *Ilex Aquifolium*
 B. Leatherwood, *Cyrilla racemiflora*
 C. Supple Jack, *Berchemia volubilis*
 D. Alder Buckthorn, *Rhamnus Frangula*
 E. Venetian Sumach, or Smoke Tree, *Rhus Cotinus*
 F. Chittam Wood, *R. cotinoides*
 G. Hairy Greenweed, *Genista pilosa*
 H. Madeira Broom, *G. virgata*
 J. Dyer's Greenweed, *G. tinctoria*
 K. Judas Tree, *Cercis Siliquastrum* (M after Sargent.)
 L. Common Quince, *Cydonia oblonga*
 M. *Cercocarpus ledifolius*
 N. *Dichotomanthes tristiaecarpa*
 (Genera not figured: *Cliftonia*, *Cornus*)



FIG. 118

- A. *Cotoneaster adpressa*
 B. *C. Franchetii*
 C. *C. horizontalis*
 D. *C. integerrima*
 E. *C. microphylla*
 F. *C. pannosa*

- G. *C. buxifolia*
 H. *C. Simonsii*
 I. *C. Harroviana*
 J. *C. serotina*
 K. *C. rotundifolia*

- M. *C. bullata*
 N. *C. Henryana*
 O. *C. multiflora*
 P. *C. frigida*
 Q. *C. nummularia*



FIG. 119

A. *Exochorda Giraldu*B. Oso Berry, *Nuttallia cerasiformis*C. *Docynia Delavayi*D Willow-leaved Pear, *Pyrus salicifolia*E. *Stranvaesia Davidiana*F. *Hakea saligna*G. *Disanthus cercidifolius*H. *Distylium racemosum*J. Adult shoot of Blue Gum
*Eucalyptus globulus*K. *E. coccifera*

(J after Gräbner.)



FIG. 120

- | | | |
|---|--|-----------------------------|
| A. <i>Bupleurum fruticosum</i> | F. <i>C. virgata</i> | M. <i>O. Forsteri</i> |
| B. Flowering shoot of Ivy,
<i>Hedera Helix</i> | G. <i>Griselinia littoralis</i> | N. <i>O. nummularifolia</i> |
| C. <i>Corokia Cotoneaster</i> | H. <i>Tupelo Tree, Nyssa
sylvatica</i> | O. <i>O. albida</i> |
| D. <i>C. macrocarpa</i> | J. <i>Ozothamnus Antennaria</i> | P. <i>O. oleifolia</i> |
| E. <i>C. buddleioides</i> | K. <i>Mutisia decurrens</i> | Q. <i>O. furfuracea</i> |
| | L. <i>Olearia aviceniifolia</i> | R. <i>O. Haastii</i> |



FIG. 121

A. *Pachystegia insignis*
 B. *Senecio elaeagnifolius*
 C. *S. compactus*
 D. *S. Greyi*
 E. *S. Huntii*
 F. *S. laxifolius*
 G. *S. Monroi*

H Cranberry, *Oxycoccus palustris*
 J. American Cranberry, *O. macrocarpus*
 K. Bog Whortleberry, or Bog Bilberry, *Vaccinium uliginosum*

L. Hairy Huckleberry, *V. hirsutum*
 M. Swamp Blueberry, *V. corymbosum*
 N Sour-top, or Velvet Leaf, *V. canadense*

(H and K after Fitch and Smith.)



FIG. 122

A. Red Bearberry, *Arctostaphylos Uva-ursi*

B. Manzanita, *A. Manzanita*

C. Australian Beard Heath, *Leucopogon Fraseri*

D. *Elliottia racemosa*

E. Male-berry, *Lyonia ligustrina*

F. *Pieris ovalifolia*

G. Stagger Bush, *P. Mariana*

H Indian Azalea, *Rhododendron indicum*

J. *R. luteum* (*Azalea pontica*)

K. *R. molle* (*Azalea mollis*)

L. *R. Anthopogon*

M. Swamp Honeysuckle, *R. viscosum*

N. Chinese Azalea, *R. sinense*

O. *R. Rhodora* (*Rhodora canadensis*)

P. *R. occidentale*

Q Creeping Snowberry, *Chiogenes serpyllifolia*

(A after Berg and Schmidt, F after Collett)



FIG. 123

- | | | |
|--|---------------------------|---|
| A. <i>Rhododendron cinnabarium</i> | D. <i>R. praecox</i> | H. <i>R. Falconeri</i> |
| B. Alpenrose, or Rose des Alpes, <i>R. ferrugineum</i> | E. <i>R. moupinense</i> | J. <i>R. fictolacteum</i> |
| C. <i>R. arboreum</i> | F. <i>R. campanulatum</i> | K. <i>R. amoenum</i> (<i>Azalea amoena</i>) |
| | G. <i>R. Nobleanum</i> | L. <i>R. Thomsoni</i> |



FIG. 124

- A. *Rhododendron ciliatum*
 B. *R. croceum*
 C. *R. ponticum*
 D. *Menziesia pilosa*
 E. *Tripetaleia paniculata*
 F. *Cladothamnus pyrolae-florus*

- G. Calico Bush, *Kalmia latifolia*
 H. *Rhodothamnus Chamaecistus*
 J. *Therorhodium camtschaticum*

- K. Date Plum, *Diospyros Lotus*
 L. Southern Buckthorn, *Bumelia lycoides*
 M. Shrubby Plumbago, *Ceratostigma Griffithii*
 (Genus not figured: *Ledum*)



FIG. 125

- | | | |
|---|---|--|
| A. <i>Buddleia alternifolia</i> | F. Woody Nightshade, or Bittersweet, <i>Solanum Dulcamara</i> | L. Willow-leaved Jessamine, <i>C. Parqui</i> |
| B. Potato Tree, <i>Solanum crispum</i> | G. Tree Purslane, <i>Atriplex Halimus</i> | M. <i>Muehlenbeckia complexa</i> |
| C. <i>Streptosolen jamesonii</i> | H. <i>Eurotia ceratoides</i> | N. Goat Wheat, <i>Atraphaxis</i> |
| D. <i>Convolvulus Cneorum</i> | J. <i>Ercilla volubilis</i> | O. <i>A Muschketowi</i> |
| E. Chinese Box Thorn, or Cottage Tea Tree, <i>Lycium chinense</i> | K. <i>Cestrum elegans</i> | P. <i>Brunnichia cirrhosa</i> |
| | | Q. <i>Polygonum baldschuanicum</i> |



FIG 126

- A. Dutchman's Pipe, or Birthwort, *Aristolochia Siphocampylus*
 B. *A. moupinense*
 C. Camphor Tree, *Cinnamomum Camphora*
 D. Sweet Bay, or Poet's Laurel, *Laurus nobilis*
 E. Spice Bush, *Lindera Benzoin*
 F. *Litsaea japonica*
 G. Fire Bush, *Embothrium coccineum*
 H. Ague Tree, *Sassafras officinale* (see also Fig. 31 G)
 I. Californian Laurel, or Spice Tree, *Umbellularia californica*
 J. Californian Laurel, or Spice Tree, *Umbellularia californica*

(A from Kew Herbarium and after *Botanical Magazine*, C after Berg and Schmidt)



FIG. 127

- A. Spurge Laurel, *Daphne Laureola*
 B. *D. Blagayana*
 C. *D. pontica*
 D. Mezereon, *D. Meze-
 reum*
 E. Garland Flower, *D. Cneorum*

- F. *D. collina*
 G. *D. odora*
 H. *D. petraea*
 J. Tasmanian Waratah, *Telopea truncata*
 K. *Edgeworthia papyrifera*
 L. Leatherwood, *Dirca palustris*
 (N after Collett.)

- M. Silkworm Thorn, *Cud-
 rania tricuspidata*
 N. *Elaeagnus umbellata*
 O. Oleaster, *E. angustifolia*
 P. *E. glabra*
 Q. *E. pungens*
 R. Silver Berry, *E. argentea*



FIG. 128

A. *Sarcococca saligna*B. *S. ruscifolia*C. *S. humilis*D. *Andrachne colchica*E. *Securinega flueggeoides*F. Osage Orange, or Bow
Wood, *Machura auranti-*
*tiaca*G. *Daphniphyllum macro-*
*podum*H. *Quercus acuta*J. *Q. glabra*K. Willow Oak, *Q. Phellos*L. Golden Chestnut, *Castanopsis chrysophylla*M. Corkwood, *Leitneria*
floridana

macro-

N. Mountain Beech, *Notho-*
*fagus cliffortioides*O. Woolly Willow, *Salix*
*lanata*P. Creeping Willow, *S.*
*repens*Q. Lapland Willow, *S. Lap-*
*ponum*R. *S. reticulata*(Fruit of F after *Gardener's Chronicle*, of M after Sargent, O-R after Moss and Hunnybun.)

DESCRIPTIONS

LIST OF SYMBOLS, ABBREVIATIONS, ETC.

- ∞ Numerous or an indefinite number
+ Shows separation into two or more layers or whorls (e g. $P_3 + 3$ = perianth of two whorls, not differentiated into sepals and petals).
* Not hardy at Kew
() Joined together (e g. $C(5)$ = a corolla of 5 united petals which cannot be pulled off without tearing, $G(5)$ = a pistil of 5 united carpels).
-

- A Stamens (e g. A_5 = 5 stamens)
C. Corolla (e g. C_5 = corolla with 5 petals)
D. Deciduous.
E. Evergreen.
Fl, Fls. Flower, Flowers
fol Foliate (e g. 3-fol = trifoliate, a leaf with 3 leaflets).
G Pistil; \overline{G} , a pistil with superior ovary, \tilde{G} , with inferior ovary; \underline{G} , with either superior or inferior (e g. \underline{G}_3 = a pistil made up of 3 separate carpels with ovaries in a position above that of the outer floral parts).
K. Calyx (e g. K_5 = calyx with 5 sepals).
L, Ls. Leaf, Leaves.
Lanc Lance-shaped.
Lft., Lfts. Leaflet, Leaflets.
Oblanc. Inversely lance-shaped (i.e. with broader end outwards).
Obov. Inversely ovate ovate (see below) with broader end outwards.
Ov Ovate (oval or elliptical in general outline, disregarding teeth or lobes)
P. Perianth (e.g. P_3 = perianth of 3 parts, not differentiated into sepals and petals).
-

First numeral after name of species shows maximum height in feet.

Second and subsequent numerals show maximum dimensions in inches.

*A full description of these and other terms
is given on pages 3-9.*

CLASS I. DICOTYLEDONS

The embryo contains two leaves (cotyledons) which, on germination of the seed, usually push up to the light and appear as the first leaves. The leaves which follow have a network of branching veins. Bark, wood, and pith are clearly distinguished in the stem. The parts of the flower are usually in fours or fives, a multiple of four or five, or a large indefinite number.

SUB-CLASS I. POLYPETALAE

Petals and sepals both present as a rule (sometimes one or both absent), petals, when present, not united (can be pulled off one by one).

Family 1 *RANUNCULACEAE* P4 or more, A ∞ , G, 2- ∞
(Anemone, Buttercup, Columbine, Delphinium)

CLEMATIS Virgin's Bower. Climbers climbing by leaf-stalks, Ls. opposite, compound Fls without conspicuous petals, their place being taken by showy sepals

(a) Fls. cup-shaped (sepals upright)

- C. aethusifolia* 6. August-October. D. Ls. pinnate; lflets ov., 2, deeply dissected. Fls $\frac{1}{2}$, yellow, nodding Manchuria.
- C. (Atragene) alpina*. Alpine Clematis. 6. April. D. Ls. twice 3-fol.; lflets. ov., 2, toothed. Fls. $1\frac{1}{2}$, violet-blue or white, with petal-like sterile stamens, slender-stalked, nodding. North Europe.
- C. campaniflora*. Bell-flowered Clematis. 20. May-July. D Ls 2-pinnate; lflets. ov., lanc., 3, entire or lobed. Fls. 1, white, tinged with violet, long-stalked, nodding. Portugal.
- C. crispa*. Frilled Clematis. 10. June. D. Ls. pinnate; lflets ov, lanc., entire or lobed. Fls 1, bluish purple, long-stalked, nodding, sepals with frilled edges. U S A.
- C. heracleifolia* 3. September D Ls 3-fol.; lflets. broadly ov., 6, coarsely toothed. Fls. 1, tubular, blue, in axillary clusters, sepals recurved at ends. China.
- C. orientalis*. See under (b).
- C. texensis (coccinea)*. Scarlet Clematis. 6. June-August D. Ls pinnate or deeply lobed; lft. often a tendril. Fls. 1, urn-shaped, red. U.S.A.
- C. Viorna*. Leather Flower. 10. May-August. D. Ls pinnate; lflets. ov., 3, entire or lobed. Fls. 1, urn-shaped, with thick reddish purple sepals recurved at ends, nodding. U.S.A.

(b) Fls. saucer-shaped (sepals spreading), solitary or in clusters of five or less

- C. florida*. 10. April-May. D. Ls. twice 3-fol.; lflets. ov., 2, entire or lobed, glossy dark green above, hairy below. Fls. 3, solitary, white with green band on back of sepals, long-stalked, stalk with two ov. bracts in middle, P6 or more. Japan.
- C. Jackmannii*. 10. August-September. D. Ls. pinnate; lflets. ov., rather large, entire or lobed. Fls. 5, purple, P usually 4. Hybrid. (Fig. 18 A.)

CLEMATIS—*continued*

C. lanuginosa 6. July. D. Ls. 3-fol. or simple; lflets. 5, heart-shaped base, woolly below Fls. 8, white to pale lilac. China.

C. montana 20 April–May. D Ls. 3-fol, lflets. ov, 4, toothed, rather wrinkled. Fls. 2½, white Himalaya. (Fig. 1 A.)

Variety *rubens*. Ls. dark brownish green on purple stems Fls. 3, rosy red.

Variety *Wilsoni*. Fls 3, white, on downy stalk.

C. orientalis. 20. August–October. D. Young stems ribbed. Ls. pinnate or 2-pinnate, last division 3-fol, lflets. ov., 2, coarsely toothed or lobed. Fls. 2, yellow, solitary, on slender stalk. Caucasus to Himalaya

Variety *tangutica*. Lflets. lanc, with spreading teeth or deeply lobed Fls. 2, yellow, cup-shaped. Hardier.

C. patens. 12. May–June D Like *C. florida*, but no bracts on flower-stalk Fls. white to blue. China and Japan.

C. venosa Like *C. florida*, but fls. reddish purple. Hybrid.

C. Viticella. 12. July–September. D. Stems slender, ribbed. Ls. pinnate or 2-pinnate; lflets. ov., 2, blunt-ended, entire or 3-lobed Fls. 1½, purple, P4 Europe.

White-, blue-, and reddish-flowered varieties in cultivation.

(c) Fls. saucer-shaped (sepals spreading), in many-flowered panicles

C. Armandii. 10 March–April. E. Ls 3-fol.; lflets. ov., 5, 3-nerved, leathery, hairless. Fls. 2½, white. China.

C. Flammula. 10. August. D. Lflets. not toothed, 2-3-lobed or 3-fol., bright green on both sides. Fls. 1, white, scented. Fruit with long feathery appendages. Europe.

Variety *rubro-marginata*. Fls. white with reddish margin.

C. Vitalba. Old Man's Beard, Traveller's Joy. 30. August. D. Ls. pinnate, 5-fol.; lflets. ov., 4. Fls. ¾, greenish white or cream. Fruit with long feathery appendages. Europe (including Britain). (Fig. 9 D.)

PAEONIA. Tree paeony. Branchlets thick, rough, and pithy, dying back more than half length after flowering. Ls. twice 3-fol. or pinnate, 18. China.

P. lutea. 5. May. D. Fls. 4, yellow. China.

P. Moutan (*P. suffruticosa*). 5. April–May. D. Fls. 12, white, pink, or red. China. (Fig. 18 B.)

ZANTHORRHIZA APIIFOLIA. Yellow Root. 2. March. D. Creeping, with erect stems. Ls. pinnate or 2-pinnate, with long hollowed main stalk; lflets. ov., 2, coarsely toothed or lobed. Fls. small, purple, in clusters of drooping panicles; K5, C small and gland-like, A5–10. Roots and stem bright yellow when cut. U.S.A. (Fig. 18 C.)

Family 2. CALYCANTHACEAE. P ∞, A5–30, G ∞

CALYCANTHUS. Ls. simple, opposite, entire. Fls. large, with numerous strap-shaped petals.

C. fertilis. 10. May–June. D. Buds hidden by base of l.-stalk. Ls. ov., 6, glaucous below. Fls. 1½, greenish purple to reddish purple. Fruit 2½, pear-shaped. South United States.

Variety *nanus*. Dwarf form. Ls. 3, green below.

CALYCANTHUS—continued

C. floridus Carolina Allspice 10. May–June. D Buds hidden Ls ov, 4, downy below. Fls 3, dark wine-red, fragrant. Fruit $2\frac{1}{2}$, pear-shaped. South United States.

C. Mohru. 10 May–June. D Fls 2, purple South-east United States

C. occidentalis Californian Allspice 10 May–June D. Buds visible L. ov, 8 Fls similar to *C. floridus*, but larger and longer stalked, and petals change to more tawny shade near tip California. (Fig 77 E.)

CHIMONANTHUS FRAGRANS (CALYCANTHUS PRAECOX, MERATIA PRAECOX). Winter Sweet November–March D. Ls opposite, lanc, 6, long-pointed, rough above Fls 1, transparent yellowish green, inner petals smaller and purplish, very fragrant, solitary on short stalk on old wood. Fruit $1\frac{1}{2}$, a stalked gourd-like structure (Bean) China and Japan (Fig 77 B)

† Family 3 MAGNOLIACEAE $K_3, C_6-\infty, A \infty, G \infty$

Ovaries spirally arranged round a column

LIRIODENDRON. Tulip Tree. C_6 . Ls alternate, lobed, with concave apex. Young ls enclosed by stipules.

L. Tulipifera 100. July. D Branchlets brown Ls. 8. Fls. $1\frac{1}{2}$, resembles tulip, greenish white with orange band near base of petal. U S A (Fig. 36 D)

Variety *aureo-maculatum* Ls blotched with yellow

L. chinensis. 50. July. D. Branchlets grey. Ls. deeply lobed. Petals without orange band. China.

MAGNOLIA. Buds large, with single outer scale Young ls enclosed by stipules. Ls alternate, large, entire. Fls. large, solitary, ovary with not more than two ovules.

(a) Fls. appear before leaves

M. Campbelli. 100. February–April. D. Bark black. Ls. ov., 12, tapering to both ends, hairy below. Fls. 10, deep rose to crimson, fragrant. Fruit 6; seeds red. East Himalaya.

M. conspicua (*M. denudata*). Yulan, Lily Tree 30. April. D. Buds covered with shaggy hairs Ls ov., 6, blunt or short-pointed, downy below. Fls. 3, white, petals thick. Fruit 8, spindle-shaped. China (Fig. 112 A.)

M. Kobus. 30. April–May. D. Usually shrubby. Branchlets hairless; l-buds slightly hairy, fl-buds densely so. Ls. obov., 4, abruptly pointed, tapering to base, light green below. Fls. 4, creamy white, petals with faint purple line at base outside. Fruit 4, cylindrical. Japan. (Fig. 112 H.)

M. Soulangeana. 30. May. D. Ls. ov., 6. Fls. white or purple, sepals at least half as long as petals which they resemble. Hybrid. (Fig. 112 B.)

Variety *Lennei.* Ls. 8, pale green. Fls. 4, petals white inside, rosy purple outside.

Variety *speciosa.* Fls. striped purple outside (Fig. 112 B.)

M. stellata. 15. March–April. D. Buds hairy. Ls. oblong, 3, margins slightly recurved. Fls. 3, white or pink, petals more numerous than that of any other magnolia. Japan. (Fig. 112 C.)

MAGNOLIA—continued

(b) *Fls appear with or after leaves*

- M. acuminata* Cucumber Tree. 90. May–June D. Buds hairy. Ls ov., 10, pointed, base rounded, downy below. Fls 3, dull greenish yellow, petals erect. Fruit dark red U.S.A. (Fig. 112 D)
Variety *aureo-variegata* Ls blotched with yellow.
- M. Delavayi* 30. June. E Buds and young branchlets downy. Ls ov., 12, dull green above, greyish white below, stalk stout, up to 3 Fls 8, white. Fruit 4, egg-shaped China
- M. Fraseri*. 50 June–July. D. Buds hairless. Ls. obov, 20, round-ended, heart-shaped base, hairless; stalk slender, up to 3. Fls 8, creamy white, fragrant Fruit 4, egg-shaped or cylindrical, red South United States. (Fig 112 E.)
- M. glauca* (*M. virginiana*). Sweet or Swamp Bay, Beaver Tree, Laurel Magnolia. 70. June–August D. or $\frac{1}{2}$ E. Branchlets slender, hairless. Buds hairy. Ls. ov., oblong, lanc, 4, leathery, bluish green above, greyish white below; stalk slender, $\frac{3}{4}$ Fls $2\frac{1}{2}$, round, white, fragrant. Fruit 2, egg-shaped, dark red. South United States. (Fig 112 G)
- M. grandiflora* Bull Bay 80 July–September. E Buds hairy. Ls. ov., 10, leathery, glossy, dark green above, red-brown felt below, clustered at end of branch. Fls. 10, round, creamy white; petals thick, concave. Fruit 4, egg-shaped, rusty-woolly. South United States. (Fig 113 D.)
- M. macrophylla*. Large-leaved Cucumber Tree. 50. July. D. Buds hairy. Ls. obov., 36, slightly heart-shaped at base, green above, white below. Fls. 12, cup-shaped, creamy white, fragrant, petals reflexed above middle, purplish at base, thick. Fruit 3, egg-shaped, rose-coloured, hairy. South United States. (Fig. 113 B)
- M. obovata* (*M. hypoleuca*). 60. April–May. D. Branchlets purplish, hairless. Buds hairless. Ls. obov, 16. Fls. 6, cup-shaped, fragrant, white with red centre. Fruit 8, cylindrical, red. Japan. (Fig 112 F.)
- M. parviflora*. 30. May–June. D. Branchlets slender. Buds hairy Ls. oblong, 6, apex contracted abruptly to short point. Fls. 2, white with red centre. Fruit 2, egg-shaped, red, with red seeds Japan. (Fig 112 J.)
- M. tripetala*. Umbrella Tree. 35. June. D. Branchlets and buds hairless. Ls. ov., 24, pointed, downy below. Fls. 9, white, heavy-scented. Fruit 4, rose-coloured. U.S.A. (Fig. 113 C.)

MANGLIETIA INSIGNIS. 100. E. Ls. alternate, lanc, 10, entire, with prominent polygonal venation (Brandis). Fls. 4, white or yellowish white tinged with pink, scented, K₃, C₉, ovary with six or more ovules. Fruit 3, narrowly egg-shaped. East Himalaya. (Fig. 113 A.)

MICHELIA. Differs from magnolia in the ovary-bearing centre of the flower being stalked. Leaf-stalk very short.

- * *M. compressa*. 20. April–June. E. Ls. ov., lanc., 4, hairless, glaucous below. Fls. 2, white, fragrant. Japan. (Fig. 114 B.)
- * *M. fuscata*. Banana Shrub. 20. April–June. E. Young shoots hairy. Ls. ov., 4, tapering to both ends, blunt, becoming nearly hairless, stalk hairy. Fls. 1, yellowish green or purple, fragrant with 'pear-drop' scent. China. (Fig. 114 A)

Family 4. *WINTERACEAE*. K_3-6 , $C \infty$, $A \infty$, G few

Ovaries in a single whorl Aromatic shrubs with alternate entire and hairless leaves.

DRIMYS. K_3 .

* *D aromatica*. 15. Summer E. Ls oblanc, 3, crowded radially at end of shoot Fls $\frac{1}{2}$, greenish white Victoria and Tasmania. (Fig 114 E.)

* *D Winteri*. Winter's Bark. 25. Summer E. Ls. lanc., 10, bright pale green, usually crowded radially at end of shoot. Fls. $1\frac{1}{2}$, ivory white; petals linear, spreading, pointed South America. (Fig. 114 F.)

ILLICIMUM Ls. lanc, entire, leathery, hairless Fls 1, solitary or in pairs in 1-axils. Fruit 1, star-shaped.

* *I anisatum*. Anise. 12. March-May. E. Ls. 3. Fls. greenish yellow. China and Japan (Fig 114 C)

* *I floridanum*. Poison Bay 8 March-May. E Ls 4, Fls. purple. South United States (Fig 114 D)

Family 5. *SCHIZANDRACEAE*. $K \infty$, $C \infty$, $A \infty$, $G \infty$

Climbers Ls alternate, faintly toothed or entire Fls. unisexual. Fruit a berry

* *KADSURA CHINENSIS* (K. *JAPONICA*) 10 September E. Ls. ov, lanc., 4, long-pointed, tapering base, dark green, hairless. Fls. $\frac{3}{4}$, white, cup-shaped, petals fleshy, solitary on slender stalk. Fruit a round head of red berries. China and Japan. (Fig. 78 D.)

SCHIZANDRA. Ls aromatic, with transparent dots. Fruit an elongated spike of red berries hanging from a slender stalk.

S chinensis (*S. japonica*). 30 April-May. $\frac{1}{2}$ E. Stems reddish brown, slightly angled, hairless, warted. Ls ov., 4, tapering at base to slender stalk, veins on lower surface appear dark green against a pale green background. Fls. $\frac{1}{2}$, pale rose-coloured, fragrant, on slender stalks, in clusters. Fruit spike 6, persisting through winter. China and Japan. (Fig. 78 A.)

S glaucescens April-May. $\frac{1}{2}$ E. Stem nearly cylindrical. Ls. glaucous below. China

S. grandiflora April-May. $\frac{1}{2}$ E. Ls. like *S. chinensis*, but thicker. Fls. 1, white tinged with pink Himalaya.

S. Henryi. April-May. $\frac{1}{2}$ E. Stem triangular when young, each angle winged. Ls. ov., 4, leathery, glaucous below. Fls $\frac{1}{2}$, white, on stout stalks up to 2 long. Berries sticky. West China.

S rubriflora. 20. April-May. $\frac{1}{2}$ E. Fls. deep crimson. West China.

Family 6. *TROCHODENDRACEAE*. P_4 or 0, $A_4-\infty$, G few

EUPTELEA. Ls. broadly ov., 4, sharp-pointed, broadly wedge-shaped base, toothed, long-stalked. Fls. small, with numerous red stamens, in axillary clusters Fruit flat, $\frac{1}{2}$, narrowly wedge-shaped, notched on one side.

E. Franchetii. 40. March-April. D. Ls. finely and more or less evenly toothed. Fruit 1-3-seeded. China. (Fig. 78 E.)

E. polyandra. 40. March-April. D. Ls. coarsely and unevenly toothed. Fruit 1-seeded. Japan. (Fig. 78 F.)

TETRACENTRON SINENSE. 100 Midwinter. D Buds slender-pointed Ls. alternate, ov, 3, palmately 5-7-nerved, heart-shaped base, finely round-toothed, slender-stalked Fls small, yellowish, in hanging spikes up to 6 long. Fruit $\frac{1}{4}$, dry, brown, 4-celled China (Fig 78 c)

TROCHODENDRON ARALIOIDES (GYMNANTHUS PARADOXUS) 30 June. E. Ls ov, lanc, 6, long-pointed, long-stalked, leathery, toothed, in whorls or grouped radially at end of whorled branches Fls rather like ivy, greenish yellow, in terminal upright racemes Fruit $\frac{3}{4}$, brown Japan (Fig. 55 F)

Family 7. CERCIDIPHYLLACEAE P₄, A ∞ , G₂₋₅

CERCIDIPHYLLUM JAPONICUM. Katsura Tree 100 March. D. Forming several spirally twisted and furrowed trunks Ls opposite, ov. or round, $2\frac{1}{2}$, heart-shaped base, palmately nerved, round-toothed, slender-stalked. Fls inconspicuous, unisexual, on separate trees Fruit $\frac{1}{2}$, a many-seeded pod. Japan. (Fig. 59 c.)

Variety *sinensis* Colours better in autumn according to Messrs. Stewart & Son, Wimborne.

✓
* Family 8. ANONACEAE K₃, C₆, A ∞ , G ∞

ASIMINA TRILOBA Pawpaw 15 May-June. D. Ls. alternate, obov, 12, entire, pointed, hairless, short-stalked, disagreeable odour when crushed Fls 2, purple, solitary, nodding at end of short thick stalk Fruit 5, bottle-shaped, in whorls, edible. South United States (Fig 114 K.)

Family 9. MENISPERMACEAE. K₃₊₃, C₃₊₃, A₃₊₃, G₃ or more
Mostly climbers. Ls. alternate, palmately nerved, entire or lobed

COCCULUS. Fls small, in axillary or terminal spikes or panicles Fruit a berry.

C. carolinus (*Menispermum carolinum*). Carolina Moonseed 12. June-July. D. Ls. round or triangular, ov., $3\frac{1}{2}$, rounded or heart-shaped base, sometimes lobed, hairless above, downy below. Fruit red. South United States. (Fig. 114 J.)

C. laurifolius (*Menispermum laurifolium*). 10. E Ls. lanc., 8, 3-ribbed, dark glossy green. Himalaya. (Fig 114 H.)

C. trilobus (*Cebatha orbiculata*). 12 August. D. Ls ov, 4, heart-shaped or tapering base, sometimes lobed, downy on both sides. Fruit bluish black. Corea and Japan.

MENISPERMUM. Ls. peltate Seed crescent-shaped.

M. canadense. Moonseed. 15. June. D. Ls. as broad as long, base straight or rounded, strongly veined, long-stalked; stalk attached just inside margin, which is sometimes divided into shallow angular lobes Fls. numerous, inconspicuous, greenish yellow, in slender, long-stalked clusters. Berries like black currants, in long loose panicles. North America. (Fig. 31 B)

M. dauricum. 15. June. D. Like above, but ls. more distinctly peltate. East Asia,

SINOMENIUM ACUTUM (*MENISPERMUM ACUTUM*, *COCCULUS DIVERSIFOLIUS*). Chinese Moonseed. 12. June D. Ls very variable in shape and size, ov, 6, heart-shaped or kidney-shaped, sometimes lobed, deep bright green, hairless, long-stalked Fls small, yellow, unisexual, in slender panicles up to 12. Berry black with blue bloom China, Corea, and Japan (Fig 30 D.)

Family 10 *LARDIZABALACEAE*. P_3+3 , A_3+3 , \underline{C}_3

Mostly climbers Ls alternate, compound, long-stalked Fruit fleshy.

AKEBIA. Climbers Lfts. notched at apex

A lobata 20 April $\frac{1}{2}$ E Ls 3-fol.; lfts ov, 3, base rounded or straight, hairless, margin undulate, long-stalked Female fls 1, maroon red; male much smaller, purple Fruit 2, sausage-shaped, pale purple, edible. Japan (Fig. 2 J)

A quinata 40 April. $\frac{1}{2}$ E Ls digitate, 5-fol; lfts ov, 2, entire, rounded or tapering base, hairless Female fls. $1\frac{1}{2}$, dark chocolate purple; male $\frac{1}{2}$, purple, all slender-stalked in slender fragrant drooping sprays. Fruit 4, sausage-shaped, grey or purple, containing numerous seeds in white pulp China and Japan (Fig 5 G.)

DECAISNEA. Buds large, pointed Young shoots, stout, hairless. Ls. pinnate, 36; lfts. ov, 6, pointed, entire, hairless, glaucous below. Fls 1, yellowish green, in drooping panicles Fruit 4, sausage-shaped, fleshy.

D Fargesii 10 June. D. Fruit bright blue. China (Fig. 10 A.)

D insignis 10 June D. Fruit yellow. Himalaya

HOLBOELLIA Climbers. Ls 3-fol. or digitate; lfts. pointed.

H coriacea 30 May E Ls 3-fol; lfts ov., 3, entire, hairless, leathery, dark glossy green. Fls 1, unisexual, fragrant, in branched clusters in l.-axils, male greenish white, female purplish. Fruit 3, sausage-shaped. China. (Fig 1 K.)

H (Stauntonia) latifolia. 50. May. E. Ls. 3-9-fol; lfts. ov., 7 Fls. and fruit as above. Himalaya.

LARDIZABALA BITERNATA Climber 30. May. E. Ls. 3-fol. or twice 3-fol.; lfts ov, 4, with a few sharply pointed teeth Male fls. $\frac{3}{4}$, purple, fleshy, in drooping spike; female fls. 1, purple, fleshy, solitary on slender stalk. Chile (Fig. 1 M.)

SARGENTODOXA (HOLBOELLIA) CUNEATA. Climber. May D Ls. 3-fol., long-stalked; lfts. unequal; terminal one ov., 5, tapering base, stalked; lateral ones slightly larger, very unequal at base, nearly stalkless; all palmately nerved, green below. Fls. $\frac{3}{4}$, unisexual, in drooping racemes, sexes on different plants. Fruit $\frac{1}{4}$, a black 1-seeded berry. China. (Fig. 2 D.)

SINOFRANCHETIA SINENSIS. Climber. 40. May. D. Ls. 3-fol. at end of long stalk; lateral lfts. ov., 6, entire, unequal-sided, nearly stalkless; terminal one stalked. Fls. small, dull white, in drooping racemes. Fruits grape-like, purple, borne alternately on long hanging stalk. China. (Fig. 1 N)

STAUNTONIA HEXAPHYLLA. Climber. May. E. Ls. 3-7-fol., long-stalked; lfts. ov., 5, pointed, leathery, hairless, long-stalked. Fls. $\frac{3}{4}$, unisexual, white tinged with violet, in few-flowered racemes. Fruit size and shape of walnut, purple, sweet, and watery. China and Japan. (Fig. 5 A.)

Family 11 *BERBERIDACEAE* $P_3+3+3+3$, A_3+3 , G_1

BERBERIS Barberry Spiny shrubs with spines usually in threes. Ls. alternate or in clusters in spine axils Fls small, yellow, usually in nodding clusters or racemes, sometimes solitary. Fruit a berry

(a) *Deciduous barberries* Ls usually obov.

Berry red

- B. aetnensis* 2 May Branchlets erect, grooved Ls. obov., $\frac{3}{4}$, bristle-toothed. Fls in short clusters Berry red. Sicily (Fig 79 A.)
- B. aggregata*. 6. July Branchlets angled. Ls obov., 1, spine-toothed, net-veined Fls in dense short clusters Berry red, style persistent. Himalaya. (Fig. 79 B)
- Variety *Prattii*. Ls. $1\frac{1}{2}$, often entire. Berry coral-scarlet
- B. aristata*. 10. June-July Branches shining reddish brown, slightly drooping. Ls. obov., 3, leathery, entire or with a few large teeth, green below Fls. in long hanging sprays Berry red, spindle-shaped. Himalaya (Fig. 79 C)
- B. brachypoda* 8 May. Branches angled, downy grey. Ls obov., 3, strongly veined below, green and downy on both sides. Fls in spikes up to 2 long Berry blood-red. China (Fig 79 D)
- B. chitria*. 10 June. $\frac{1}{2}$ E. Ls obov., 3, sparsely toothed or entire, green on both sides Fls. $\frac{3}{4}$, pale yellow, in drooping panicles Berry $\frac{1}{2}$, oblong, dark red or purple. Himalaya. (Fig. 80 K)
- B. concinna*. 3 June. Branches furrowed. Ls obov., 1, glossy green above, white below, spine-toothed Fls $\frac{1}{2}$, round, solitary. Berry $\frac{3}{4}$, oblong, red. Himalaya. (Fig 79 E.)
- B. diaphana*. 6. May. Branches stout, grooved, yellowish. Ls obov., $1\frac{1}{2}$, blunt-ended, toothed or entire, glaucous and net-veined below Fls. in twos and threes on common stalk Berry egg-shaped, red, with slight bloom. China. (Fig. 79 G.)
- B. dictophylla*. 6 May Branches covered with white bloom when young. Ls. obov., 1, spine-tipped, entire or with a few spiny teeth on margin, bright green and net-veined above, chalky white below. Fls. solitary or in pairs. Berry egg-shaped, scarlet China. (Fig. 79 F)
- B. polyantha*. 12. August. Ls. obov., 1, blunt-ended, spine-toothed, dull green above, glaucous below, net-veined on both sides. Fls in long, much-branched panicles Berry oblong, salmon-red. China (Fig. 79 H.)
- B. Sieboldii*. 3. May. Ls. narrow obov., $2\frac{1}{2}$, thin, margins crowded with fine bristles. Fls. in short clusters. Berry round, bright red, glossy. West China (Fig. 79 J.)
- B. Thunbergii*. 8. April. Much branched; branches strongly grooved, yellowish or purplish red; spines usually single. Ls. obov., 1, very unequal, entire, bright green turning red in autumn. Fls. inconspicuous, reddish outside, solitary or in small clusters. Berry egg-shaped, bright red, glossy. Japan. (Fig. 79 K.)
- Variety *minor*. Dwarf form with small ls.
- Variety *pluriflora*. Low-spreading shrub turning brilliant scarlet in autumn.
- B. Vernae*. 10. April. Branches grooved, spines single at top. Ls. oblanc.,

BERBERIS—continued

- 1 $\frac{3}{4}$, with a few bristle-like teeth Fls in dense sprays up to 1 $\frac{1}{2}$ Berry round, transparent, salmon-red West China. (Fig. 79 N.)
- B. vulgaris* Common Barberry. 10. May Branches strongly grooved, yellowish when young, grey in second year Ls. obov., 1 $\frac{1}{2}$, tapering to a stalk, dull green, finely toothed Fls. in drooping racemes up to 3. Berry $\frac{1}{2}$, egg-shaped, bright red Europe (including Britain). (Fig. 79 M)
Variety *purpurea*. Ls. purple.
Also numerous forms with variegated ls.
- B. Wilsonae* 4 May. Branches thin, reddish brown, with short internodes. Ls. oblanc, $\frac{3}{4}$, entire, glaucous below Fls in small clusters Berry round, coral- or salmon-red, style persistent West China. (Fig. 79 L.)
Variety *Stapfiana*. Berry egg-shaped.
Variety *subcaulhalata* Ls. obov., sometimes with one or a few teeth near apex, whitish below, turning brilliant red in autumn. Bright red, produced in abundance
- B. yunnanensis*. 6. May Like *B. diaphana*, but branches reddish and fls. in racemes. China (Fig. 79 O)
- (b) *Evergreen or half-evergreen barberries*. Ls.
often lanc. Berry blue or black
- B. Darwinii*. 12. April-May. Ls. 1 $\frac{1}{2}$, holly-like, 3-spined at apex Fls. golden-yellow, produced in great abundance in drooping racemes up to 4 Berry egg-shaped, dark purple, with long style. Chile. (Fig. 80 A.)
- B. chitria*. See under (a).
- B. Gagnepanii*. 5. May-June Ls. lanc, 5, dark green, toothed, wavy. Fls. $\frac{1}{2}$, in small clusters. Berry $\frac{1}{2}$, egg-shaped, bluish black, bloomy. China. (Fig. 80 C.)
- B. hakeoides*. 12. May. Stem-spines small Ls. round, 1, spiny-toothed. Fls. in dense round clusters. Berry bluish black. Chile. (Fig. 80 F.)
- B. Hookeri* (*B. Wallichiana*) 5 April-May. Ls. lanc, 3, with a few spiny teeth, glossy dark green above, white below. Berry $\frac{1}{2}$, conical, black-purple. Himalaya. (Fig. 80 D.)
- B. insignis*. 6. May. Ls. lanc, 5, solitary or in threes, long-pointed, spiny-toothed or entire Himalaya. (Fig. 80 E.)
- B. Lycium* 8 June Branches grey or white, rigid. Ls. oblanc., 2 $\frac{1}{2}$, leathery, entire, stiff-pointed. Fls. in short racemes Berry oblong, violet-blue. Himalaya. (Fig. 80 B.)
- B. pruinosa*. 8. June. Branchlets cylindrical, yellowish. Ls. obov., 2 $\frac{1}{2}$, leathery, glossy above, often grey-white below, teeth slender and spiny. Fls. in short clusters. Berry covered with white bloom. China. (Fig. 80 G.)
- B. Sargentiana*. 6. June. Branches cylindrical, reddish when young. Ls. lanc., oblong, 4, closely spine-toothed, leathery. China. (Fig. 80 H.)
- B. stenophylla*. 12. April-May. Branches slender, cylindrical, downy. Ls. narrow lanc., 1, entire, spine-pointed, margin recurved, dark green above, whitish below. Fls. golden-yellow in small clusters produced in great profusion. Hybrid. (Fig. 80 J.)
Many varieties in cultivation.
- B. Veitchii* (*B. acuminata*). May. Stem-spines stout. Ls. narrow, lanc., 5,

BERBERIS—continued

- spine-toothed Fls $\frac{3}{4}$, brownish yellow, in small clusters Berry $\frac{1}{2}$, oblong China (Fig 80 M.)
- B verruculosa* 3 May Branchlets cylindrical, thickly warted. Ls. ov., lanc, 1, with a few spiny teeth, margin recurved, glossy dark green above, glaucous below. Fls $\frac{3}{4}$, golden-yellow, solitary or in twos. China (Fig. 80 L)

MAHONIA. Stem without spines Ls alternate, pinnate, usually spine-toothed. Fls yellow, in erect racemes. Fruit a bluish-black berry.

- M. Aquifolium* (*Berberis Aquifolium*) Oregon Grape 3. February–April. E. Lfts ov, 3, unequal at base, with small spiny teeth, leathery, dark green, glossy North America (Fig 12 F)
- M. Fremontii* 12. May–June E. Lfts ov., $1\frac{1}{2}$, pale bluish grey, very spiny. South United States.
- M* (*Berberis*) *japonica* 10 March–April. E. Thick unbranched stem bearing a few ls. at top. Lfts ov, 5, unequal at base, with a few large spiny teeth Fls lemon-yellow, very fragrant. Japan (Fig. 12 G.)
- M. (Berberis) nepalensis*. 20 March–April E Bark soft, corky. Lfts. lanc., $4\frac{1}{2}$, equal at base or nearly so, spine-toothed, leathery, glossy. Himalaya (Fig. 12 E)

* *NANDINA DOMESTICA*. Heavenly Bamboo 8 June–July E. Stems erect, spineless, unbranched Ls opposite, 2-3-pinnate; lfts linear, lanc., 4, entire, long-pointed, hairless, tinged with red when young, purplish in autumn. Fls $\frac{1}{2}$, white, with large yellow anthers, in large erect panicle. Fruit $\frac{1}{4}$, a bright red or purplish 2-seeded berry with persistent style. China and Japan. (Fig. 22 A.)

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Family 12 *PAPAVERACEAE*. K₂-3, C₄-6, A ∞, G̅ (2-∞)
(Poppy, Greater Celandine)

DENDROMECON RIGIDUM. Californian Tree Poppy, Shrubby Poppy. 10. Summer. D. Ls. alternate, lanc, 3, pointed, entire, thick, bluish green, net-veined, short-stalked. Fls 3, yellow, solitary, fragrant, K₂, C₄. Seed-pod 4, linear, curved, grooved California. (Fig. 114 G.)

ROMNEYA COULTERI. 8. Summer. D. Stems herbaceous Ls. alternate, 4, lobed, very glaucous, a few spiny bristles on midrib and stalk. Fls 5, solitary or in pairs, five or six white satiny petals, sepals smooth, stamens yellow. Seed-pod densely covered with stiff yellowish bristles. California (Fig. 36 E.)

Variety *trichocalyx*. Sepals bristly.

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†Family 13. *CRUCIFERAE*. K₂+2, C₄, A₆, G̅ (2)
(Aubretia, Cabbage, Stock, Wallflower)

ALYSSUM. Ls. alternate, downy with star-shaped hairs, usually silvery grey.

- A. argenteum*. $1\frac{1}{2}$. June–July. E. Young stems covered with silvery down. Ls. linear, oblanc., 1, silvery-downy below. Fls. yellow, in flattish branched clusters about 4 across. South Europe. (Fig. 50 N.)
- A. saxatile*. Gold Dust, Golden Tuft. $1\frac{1}{2}$. April–May. E. Ls. oblanc., 6, blunt-ended with small abrupt point, downy below. Fls. $\frac{1}{4}$, yellow, in rounded heads about 1 across Europe (Fig. 115 A.)

ALYSSUM—continued

A spinosum 1 April–May E. Spiny, spines slender. Ls narrow, oblong, oblanc, 2, entire, silvery-downy on both sides Fls white, fragrant, in terminal heads $\frac{3}{4}$ across South Europe. (Fig 115 F)

IBERIS Ls green, hairless or nearly so, blunt-ended, seed-pod deeply notched at apex

I. gibraltarica Gibraltar Candytuft $1\frac{1}{2}$ April–May E Ls. oblanc., 2, toothed near apex or entire Fls lilac pink South Spain, Morocco.

I. sempervirens Evergreen Candytuft $1\frac{1}{2}$ April–June E Ls. linear, 2. Fls white South Europe, West Asia. (Fig 52 B)

VELLA. Ls alternate, entire, bristly Fls. yellow, in erect terminal racemes Seed-pod $\frac{1}{4}$, egg-shaped

* *V. Pseudocytisus* Cress Rocket 2 June–July. E. Ls. obov, $\frac{3}{4}$, covered with stiff bristly hairs (like miniature cactus ls) Fls. 1 Pod beaked. Spain. (Fig 115 E.)

* *V. spinosa*. 2. May E Spiny Ls linear, 1, fleshy Fls $\frac{3}{4}$, few. Spain. (Fig. 50 M)

Family 14 CISTACEAE K₃₋₅, C₅, A ∞ , G̅ (3) or (5–10)

CISTUS Rock Rose, Sweet Cistin May–June. E. Ls. opposite, stalks in contact at base G̅ (5–10)

(a) Ls 3-nerved, or 3-nerved at base

C albidus. 6. Young parts white-felted Ls. ov, 2, blunt-ended, margins recurved, net-veined below. Fls. $2\frac{1}{2}$, pale lilac with patch of yellow at base of each petal, K₅ South-west Europe

C. crispus. 2. Stems clammy, shining Ls narrowly wedge-shaped, $1\frac{1}{2}$, clammy, margins wavy. Fls $1\frac{1}{2}$, purplish red, K₅, crowded in terminal heads. Mediterranean region.

C. cyprius 8 Ls lanc, 3. Fls. 3, white with red blotch at base of petal, in long-stalked clusters. Cyprus.

C florentinus 4 Not clammy. Ls lanc., $1\frac{1}{2}$, wavy. Fls. 2, white with yellow blotch Hybrid

* *C ladaniiferus* Gum Cistus. 5. Very clammy. Ls. linear, lanc, 4, covered with dirty white down. Fls 4, white with purple blotch, K₃, solitary. South-west Europe. (Fig. 68 H.)

Variety *albidus*. Petals yellow at base, not blotched with purple.

. *C. laurifolius* Bush Rock Rose. 8. Ls. ov., lanc., 3, wavy, hairy, long-stalked. Fls. 3, white with yellow at base of petals, K₃, in hairy erect clusters. South-west Europe. (Fig. 68 J.)

C. laxus. 6. Ls lanc., 3, dark green. Fls. 2, white, rose-like. South France.

C. Loretii. 3. Clammy. Ls. linear, lanc., $2\frac{1}{2}$, margins recurved, grey below. Fls. 2, white with crimson blotches. Hybrid.

C. lusitanicus 4. Ls. oblong, $2\frac{1}{2}$, rough and sticky. Fls. $2\frac{1}{2}$, white with crimson blotches, in terminal clusters. Hybrid.

C. monspeliensis. 3. Clammy. Ls. lanc., 2, dark green and wrinkled above,

CISTUS—continued

- greyish and hairy below, margins recurved. Fls. 1, white. Mediterranean region.
- C. populifolius* 6. Clammy. Ls. ov., $2\frac{1}{2}$, long-pointed, heart-shaped base, long-stalked. Fls. 3, white with yellow stain. South-west Europe.
- C. purpureus* 4 Clammy. Ls. lanc, 2, greyish green. Fls. 3, reddish purple with dark red blotches Hybrid
- C. salvifolius* 2 Ls. ov, $1\frac{1}{2}$, greyish green, wrinkled above, hairy on both sides. Fls. $1\frac{1}{2}$, white with yellow stain Mediterranean region.

(b) *Ls. not 3-nerved*

- C. corbariensis*. 4 Clammy Ls. ov., 2, hairy, margins wavy. Fls. $1\frac{1}{2}$, white with yellow stain at base of each petal South Europe (Fig. 68 g)
- C. villosus* 4 Ls. ov, 2, grey down on both sides, wrinkled. Fls. $2\frac{1}{2}$, purple or rose-coloured. Mediterranean region. (Fig. 68 f.)

HELIANTHEMUM. Rock Rose, Sun Rose May–June. E G (3)

- H. alpestre* Alpine Sun Rose. 1. Ls. ov., lanc, $\frac{3}{4}$, green on both sides, hairless or nearly so Fls. $\frac{1}{2}$, yellow Alpine regions of Central Europe, Caucasus, and Asia Minor.
- H. alyssoides*. 2. Ls. lanc, 1, grey with dense down. Fls. $1\frac{1}{2}$, yellow. South-west Europe.
- H. appenninum* (*H. polifolium*). White Rock Rose. $1\frac{1}{2}$. Ls. linear, 1, grey down on both sides Fls. 1, white, K5 (3 large, 2 small). Europe (including Britain). (Fig. 68 l.)
- H. canum*. Hoary Rock Rose $\frac{1}{2}$. Ls. lanc, 1, green and hairy above, white-felted below Fls. $\frac{1}{2}$, yellow Europe (including Britain) (Fig. 68 k)
- H. formosum* (*H. lasianthemum*, *Cistus formosus*) Sweet Cistin. 3 Ls. ov., 1, downy on both sides, 3-nerved. Fls. $1\frac{1}{2}$, lemon-yellow with five purple patches in centre Portugal
- H. vulgare* Common Rock Rose. 1. Ls. oblong, 1, green above, greyish down below Fls. 1, yellow, K5 (3 large, 2 small). Europe (including Britain). (Fig. 68 m.)

Variety *diversifolium multiplex*. Ls. whitish below. Fls. double, dark red.

Variety *mutabile*. Ls. grey below. Fls. pale rose.

Family 15. VIOLACEAE. K5, C5, A5, G (3)

(Violet, Pansy)

HYMENANTHERA. Fls. small, inconspicuous, brownish yellow, solitary or in crowded axillary clusters Fruit a white berry.

* *H. chathamica*. 6. E. Ls. alternate, ov., lanc., 4, toothed, prominently veined on both sides, short-stalked. New Zealand. (Fig. 78 g.)

H. crassifolia. 6. April. $\frac{1}{2}$ E. Branches grey, stout, rigid, spreading. Ls. obov., 1, entire, rounded or notched at apex, hairless, often in clusters. New Zealand. (Fig. 115 h.)

* MELICYTUS RAMIFLORUS. 30. June. D. Bark white. Branchlets pale green

spotted with white, hairless. Ls alternate, oblong, lanc., 6, tapered towards both ends, coarsely toothed, two pointed stipules at base of l-stalk. Fls. small, yellowish green, in clusters in joints of previous year's growth. Clusters of violet-blue berries. New Zealand (Fig 78 M)

Family 16. *BIXACEAE* K₅, C₅ or 0, A ∞, G̅ (2)

AZARA. Ls alternate, with very large stipules, one of which is usually enlarged to resemble a second leaf. Fls small, without petals, but with conspicuous yellow stamens, crowded in small axillary branched clusters. Fruit a berry.

* *A. dentata*. 12 July E Ls. ov, 2, toothed, bitter. Fls fragrant. Chile.

* *A. Gilliesii* (*Quillaja petiolaris*). 20. April-May E Ls ov., 3, distantly toothed, glossy green, hairless. Chile. (Fig 78 J)

A. microphylla 25. February-April E. Ls. ov, 1, with a few teeth or entire, glossy, hairless, crowded. Berry red or orange. Chile. (Fig. 78 H.)

* BERBERIDOPSIS CORALLINA. Strangle Bush, Coral Barberry July-September. E. Climber Ls ov, 4, square-cut at base, coarsely spine-toothed, leathery, glaucous below. Fls. ½, round, crimson, drooping, long-stalked. Fruit ½, a berry. Chile (Fig 78 K)

CARRIEREA CALYCINA. 30. June D Young shoots and l-stalks reddish. Ls alternate, ov, 5, 3-nerved and rounded or heart-shaped at base, distantly round-toothed, slender-stalked. Fls. 1, bluish white, cup-shaped, stalk with pair of yellowish bracts, in terminal panicles. Fruit 3, spindle-shaped, splitting into three; seeds winged. China. (Fig. 81 D)

IDESIA POLYCARPA. 30 June D Ls. ov., 6, heart-shaped base, distantly toothed, dark green above, glaucous white below, long-stalked. Fls. ½, yellowish green, without petals, in large terminal panicles. Bunches of red berries turning from green to dark brown or red. China and Japan (Fig 81 A)

POLIOTHYRSIS SINENSIS. 40 July-August D. Ls ov, 6, long-pointed, toothed, hairless or nearly so, long-stalked. Fls. ¼, greenish white or yellow, in loose terminal panicles. Fruit ¾, an egg-shaped many-seeded capsule, seeds winged. China. (Fig. 78 L)

XYLOSMA RACEMOSA. Tung-Ching Tree. 80. August E. Stem spiny. Ls. alternate, broadly ov, 3, rounded or broadly wedge-shaped base, unevenly toothed, short-stalked. Fls. small, yellow, fragrant, unisexual, in small axillary racemes. Fruit ¼, dark purple, style persistent. China. (Fig. 82 H)

Family 17. *PITTOSPORACEAE*. K₅, C₅, A₅, G̅ (2-5)

BILLARDIERA LONGIFLORA. Purple Apple Berry. Climber, 6, July. E. Stems slender, hairless. Ls. lanc., 1½, entire. Fls. ¾, greenish yellow, drooping, slender-stalked, solitary in l.-axils. Fruit 1, oblong, dark blue. Tasmania. (Fig. 115 B.)

Variety *fructu-albo*. Berries white

BURSARIA SPINOSA. 15. August. E. Ls. alternate, obov., 1½, toothed at apex, stalkless. Fls ¼, white, petals narrow, in terminal panicles. Fruit ¼, a flat reddish brown capsule, produced in great abundance. Australia. (Fig. 81 B.)

PITTOSPORUM Evergreen shrubs or small trees Ls alternate, rather fleshy, usually with a pretty green and white network of veins (best seen when l is held up against light), often grouped radially at end of branches Fruit a round or egg-shaped capsule.

(a) *Fls. dark red or purple*

- * *P. bicolor*. 40. November–April Ls linear, $2\frac{1}{2}$, entire, margins recurved. Fls deep crimson Tasmania (Fig. 51 J)
- * *P. crassifolium* 15. May Ls. ov., 4, entire, leathery, covered with pale brown or whitish down Fls. 1, dark purple, petals strap-shaped New Zealand. (Fig. 115 D)
- * *P. divaricatum*. 12 May Ls linear, obov or pinnately lobed, $\frac{3}{4}$. Fls. very small, deep maroon, almost black, solitary. New Zealand. (Fig. 36 M)
- * *P. patulum*. 15 May. Ls. linear, 2, lobed on young plants. Fls bell-shaped, dark crimson, in terminal cluster. New Zealand (Fig. 51 H)
- * *P. tenuifolium* (*P. Mayr*) 30. Trunk slender; branchlets almost black Ls. ov., $2\frac{1}{2}$, entire, pale shining silvery green, margins wavy Fls $\frac{1}{4}$, dark chocolate-purple, very fragrant. New Zealand (Fig. 116 B.)

(b) *Fls white, yellow, or greenish*

- * *P. Dallii*. 18 June–July Ls lanc., $4\frac{1}{2}$, toothed or entire, crowded radially at end of shoot. Fls $\frac{1}{2}$, white, crowded in terminal cluster New Zealand. (Fig. 81 C)
- * *P. eugenoides*. 40 Ls lanc., 5, margins often wavy Fls very small, greenish yellow, in dense terminal clusters. New Zealand (Fig. 116 A.)
- * *P. pauciflorum*. 6. May. Ls. oblanc., 5 Fls. $\frac{1}{2}$, dull yellow, fragrant. China (Fig. 115 M)
- * *P. revolutum* 12 May Young shoots and ls felted with pale brown wool. Ls. lanc., $4\frac{1}{2}$, brown wool below. Fls. yellow, petals recurved. Australia (Fig. 116 C)
- * *P. Tobira*. 20 May–July. Ls. obov., 4, blunt-ended, leathery, hairless, midrib white, strongly aromatic, grouped radially at end of shoot. Fls. 1, white or yellow, fragrant, in terminal clusters. China and Japan. (Fig. 115 C)
- * *P. undulatum*. 40. May–July. Ls ov., lanc., 6, entire, laurel-like, glossy green, margins often wavy, grouped radially at end of shoot. Fls. $\frac{3}{4}$, creamy white, in terminal clusters. Australia. (Fig. 115 L)
- * **SOLLYA HETEROPHYLLA**. Australian Bluebell Creeper. 6. April–May. E. Climber. Ls. alternate, ov., lanc., 2, entire, short-stalked. Fls. $\frac{3}{4}$, blue, in drooping branched clusters. Fruit 1, a sausage-shaped berry. West Australia. (Fig. 115 G)

Family 18. **POLYGALACEAE**. K₅, C₃₋₅, A₄₊₄, G̅ (2)

POLYGALA CHAMAEBUXUS. Milkwort. 1. April–May. E. Creeping plant. Ls. alternate, ov., 1, box-like, dull green, with small pointed tip. Fls. $\frac{1}{2}$, pea-like, creamy white, end of keel bright yellow. Fruit a flat 2-seeded capsule. Alps of Central Europe. (Fig. 115 J.)

Variety *purpurea*. Fls. purple with yellow centre.

Family 19 *FRANKENIACEAE*. K (4-7), C 4-6, A6, \overline{G} (3)

FRANKENIA LAEVIS Sea Heath May E. Low heath-like shrub seldom exceeding 3 inches in height Ls. in whorls, $\frac{1}{4}$, thick, much recurved. Fls small, pinkish white, petals spreading, solitary Europe (including east coast of Britain). (Fig. 48 o)

Family 20 *TAMARICACEAE*. K (4-5), C4-5, A4-10 or ∞ , \overline{G} (4-5 or 2)

Ls alternate, minute, scale-like, giving the slender branches the appearance of green plumes.

MYRICARIA (*TAMARIX*) *GERMANICA* 8 Summer E. Branches erect, plume-like Ls greyish glaucous. Fls very small, pink or pinkish white in dense terminal racemes Europe

TAMARIX Tamarisk Ls green or hairy.

(a) *Fls in spring on lateral or previous year's branchlets, 4-parted*

T. tetrandra 15 May D Branchlets arching, almost black. Fls. very small, rose-coloured, A4, in straight cylindrical racemes Mediterranean region (Fig 49 A)

(b) *Fls in late summer in terminal racemes, 5-parted*

T. anglica. 10 August-October E Branchlets erect, reddish brown Fls. pink, petals deciduous, A5 Europe (including Britain)

T. gallica. 12 July-September $\frac{1}{2}$ E. Branchlets purplish. Fls. white tinged with pink, petals deciduous, A5. Mediterranean region.

T. hispidula. 4. August-September D. Branchlets and ls. downy Ls. very glaucous. Fls bright pink. West Asia

T. pentandra 15 July-August. D. Branchlets purple. Fls. rose-carmine, petals persistent. Mediterranean region

Family 21. *HYPERICACEAE*. K4-5, C4-5, A ∞ , \overline{G} (3-5)

Ls. opposite, entire, dotted with transparent glands, stalkless or nearly so. Fls. yellow, showy.

ASCYRUM HYPERICOIDES St Andrew's Cross 1. July-September. D. Stems 2-edged. Ls narrow obov, 1. Fls $\frac{3}{4}$, solitary or in threes, terminal, petals four, arranged in form of St Andrew's Cross. U.S.A. (Fig. 68 E.)

HYPERICUM. St. John's Wort. Petals and sepals five; stamens in three to five bundles.

(a) *Fls. with five styles*

H. calycinum. Rose of Sharon. 1 $\frac{1}{2}$ June-September. E. Stems angled. Ls. ov, 4, glaucous below. Fls 3. South-east Europe and Asia Minor. (Fig 68 A.)

H. Hookerianum (*H. oblongifolium*). 5. August-September. E. Stems cylindrical Ls. ov., lanc., 4, blue-green above, glaucous below. Fls. 2, cup-shaped. Himalaya.

HYPERICUM—continued

H. Moserianum. 1. August–September. E Stems arching, reddish. Ls. ov., 2. Fls 2 Hybrid

H. patulum 3. August–September E Stems arching, purplish, 2-edged. Ls. ov., 2, the pairs often some distance apart, pointed. Fls 2. India and China (Fig. 68 B)

(b) *Fls with three styles*

H. Androsaemum. Tutsan 3 July–August $\frac{1}{2}$ E Stems 2-edged Ls. ov., 4, heart-shaped base, whitish below, slightly aromatic Fls. $\frac{3}{4}$, pale yellow. Europe (including Britain). (Fig 68 E)

**H. Coris* 2. August–September D. Stems cylindrical Ls. linear, $\frac{3}{4}$, in whorls, margins recurved Fls. $\frac{3}{4}$, in terminal panicles South Europe (Fig 52 F)

H. elatum. 5. July–August $\frac{1}{2}$ E Stems slightly 2-edged Ls. ov., 3, blunt-ended, often with heart-shaped base, aromatic when crushed. Fls. 1, sepals reflexed in fruit Canary Islands (Fig. 68 c)

H. hircinum 3. August–September. $\frac{1}{2}$ E. Stems 2-edged. Ls. ov., lanc., 2, goat-like smell when crushed. Fls 1, sepals deciduous. South Europe.

Family 22. *TERNSTROEMIACEAE*. K_5 , 6 or 7, C_5 or more, $A \infty$, \bar{G} (3–5) or 3–5

Ls. alternate, simple

ACTINIDIA. Deciduous climbers with chambered pith.

A. arguta. 50. June. Stems hairless or nearly so Ls. ov., 5, abruptly pointed, heart-shaped or rounded at base, margins set with fine bristly teeth, green and bristly on midrib below, long-stalked, stalk often bristly. Fls. $\frac{3}{4}$, greenish white, in 3-flowered clusters in l.-axils. Fruit 1, an oblong, greenish-yellow berry Japan.

A. chinensis. 25. June. Similar to above, but stems densely hairy. L.-stalk rose-coloured Fls $1\frac{1}{2}$, creamy white. Fruit 2, egg-shaped, hairy, edible. China and Japan. (Fig 81 F)

A. Kolomikta. Kolomikta Vine. 10 June. Stems hairless or nearly so. Ls. ov., 5, long-pointed, unevenly toothed, often with white or pink blotch at apex of blade. Fls. 1, white, fragrant Fruit 1. China and Japan.

CAMELLIA. Ls. smooth, shiny, and somewhat leathery. Fls. large and showy, solitary or in few-flowered clusters in l.-axils.

(a) *Sepals five*

C. cuspidata. 6. May. E Young stems downy. Ls. ov., lanc., 3, long-pointed, vaguely toothed. Fls. $1\frac{1}{2}$, white, solitary. West China. (Fig. 82 c.)

**C. Thea* (*Thea chinensis*) Tea Plant. 20. May. E. Ls. ov., lanc., 6, blunt-ended, toothed, upper surface somewhat raised between veins. Fls. $1\frac{1}{2}$, white, petals rounded India and China. (Fig. 82 A.)

(b) *Sepals more than five*

C. japonica. 40. April–May. E Branchlets hairless. Ls. ov., 4, short-pointed, toothed. Fls. 3, red. Japan. (Fig. 81 G.)

Variety *Donckelaarii*. Ls. lanc. Fls. red, double.

Numerous other varieties in cultivation with white or red fls.

CAMELLIA—continued

- **C. Sasanqua*. 6 May. E. Branchlets downy Ls ov., 3, hairy on midrib above. Fls 2, white China. (Fig. 82 B)

Several garden varieties in cultivation, with white to deep rose, single or double fls

CLEMATOCLETHRA Climbers July. D Buds conspicuous, with overlapping scales Ls alternate, ov., toothed (sometimes minutely), hairless except on midrib above and below. Fls. $\frac{1}{2}$, white, in axillary branched clusters Fruit berry-like Several species from China (Fig. 81 E)

- **CLEYERA FORTUNEI*. 6 September E. Branchlets hairless. Ls. lanc., 6, entire, tapering to both ends, hairless, margins yellow Fls. $\frac{3}{4}$, pale yellow, in axillary pairs. China. (Fig. 116 G.)

EURYA. Fls. small, inconspicuous; sepals and petals five

- E. (Ternstroemia) japonica*. 3 E Ls ov., 3, dark glossy green, toothed, base of l.-stalk continued down stem as prominent raised line on both sides. Fls. white, nodding, in few-flowered clusters in l.-axils, unisexual. Fruit a black berry Japan (Fig. 82 D)

- **E. (Cleyera) ochracea* Small tree E. Ls ov., 5, entire, leathery, glossy, longish point with rounded tip. Fls white or yellow, fragrant, in small clusters in l.-axils Fruit a red berry Himalaya, China, and Japan. (Fig. 116 E)

GORDONIA Fls. large and showy, parts of fl in fives, stamens in groups of five, sepals very unequal; seed-pod with persistent axis.

- **G. Altamaha (G. pubescens, Franklma Altamaha)*. 20. September–October. D. Branchlets downy. Ls. obov., oblanc., 6, tapering gradually to short stalk, toothed towards apex, dark glossy green above, pale and downy below. Fls. 3, white, solitary in l.-axil on very short stout stalk. Seed-pod round. South United States. (Fig. 82 E.)

- **G. axillaris*. 20. November–May. E. Branchlets hairless, grey. Ls. oblanc., 7, thick, leathery, toothed towards end, hairless, dark glossy green Fls. 6, creamy white, petals deeply notched, stamens yellow; solitary on short stalk. China. (Fig. 82 G.)

- **G. Lasianthus*. Loblolly Bay. 70. July–August. E. Ls. obov., oblanc., 4, toothed, hairless. Fls. 2, white, long-stalked, solitary. Seed-pod egg-shaped, pointed. South United States. (Fig. 82 F.)

- **HARTIA SINENSIS*. 50. June. E. Ls. ov., 5, pointed, toothed, dark glossy green, conspicuously veined below, stalk broad and hairy. Fls. $1\frac{1}{2}$, white, petals roundish with jagged edges, solitary in l.-axils. Fruit $\frac{3}{4}$, conical, woody. China. (Fig. 83 A.)

STACHYURUS. K₄, C₄, A₈, G (4).

- S. chinensis*. 12. March–April. D. Branchlets greenish or dark brown. Ls. ov., 4, long-pointed, toothed, rounded or heart-shaped base. Fls. small, yellow, in drooping spikes, which attain full length in autumn and persist in bud throughout winter. Fruit $\frac{1}{2}$, berry-like, greenish yellow with reddish cheek. China. (Fig. 83 B.)

- S. praecox*. 12. March–April. D. Like above, but branchlets reddish, smooth, and shining. Japan.

STEWARTIA. Bark smooth, flaky, buds silky. K_5 , C_5 , $A \infty$, \bar{G} (5)

S. Malachodendron (*S. virginica*) 15 July–August D. Branchlets downy. Ls ov, 4, toothed, tapering base, margins fringed with fine hairs, short-stalked. Fls $3\frac{1}{2}$, white, petals spreading, stamens purple; solitary in l.-axils. Fruit $\frac{1}{2}$, egg-shaped, woody South United States. (Fig. 83 D.)

S. pentagyna 15. July–August D Branchlets hairless. Ls. ov., 4, rounded base, tinged with red, sparsely toothed, short-stalked Fls. $2\frac{1}{2}$, white, cup-shaped, stamens yellow; solitary in l.-axils Fruit $\frac{3}{4}$, egg-shaped, sharply 5-angled South United States (Fig 83 E)

S Pseudo-camellia 50. July–August D. Branches upright; bark red, peeling off in large flakes; branchlets hairless, slender Ls ov, 3, thick, tapering base, sparsely toothed, bright green tinged with red above, pale green below. Fls. 2, waxy white, cup-shaped, stamens yellow, solitary in l.-axil Fruit egg-shaped, 5-angled Japan. (Fig 83 c)

† Family 23 MALVACEAE K_5 or (5), C_5 , $A (\infty)$, \bar{G} (1– ∞)

Ls. alternate, mostly palmately nerved at base.

ABUTILON. Ls. long-stalked, palmately nerved, heart-shaped base. Fls solitary, drooping, sepals often brightly coloured

* *A. megapotamicum*. Summer. Ls lanc, 3, toothed. Fls. $1\frac{1}{2}$, sepals red, petals yellow, stamens long and drooping (like a fuchsia) Brazil. (Fig. 83 H)

* *A. vitifolium* 30 May–July. Stems white-felted. Ls. ov., 5, covered with velvety down, 3-5-lobed, lobes pointed. Fls. 2, pale mauve, cup-shaped, stamens yellow Chile. (Fig. 29 c.)

Variety *alba*. Fls. white.

HIBISCUS SYRIACUS (ALTHAEA FRUTEX) Shrubby Althaea. 10 August. D. Ls. ov., 4, 3-lobed, coarsely toothed, tapering or rounded base, palmately nerved, slender-stalked. Fls. 4, trumpet-shaped, white, red, purple, blue, or striped, double or semi-double; solitary in l.-axils. Seed-pod divided into five compartments. India and China. (Fig. 29 B.)

Variety *variegatus*. Ls. variegated with white.

HOHERIA. Fls. 1, white, in axillary few-flowered clusters.

H. Lyalli (*Plagianthus Lyalli*, *Gaya Lyalli*). 30 July. D. Ls. ov., $4\frac{1}{2}$, heart-shaped base, jaggedly toothed or slightly lobed, bright green above, pale or whitish below, long-stalked. Petals broad, overlapping. Fruit $1\frac{1}{2}$, round. New Zealand. (Fig. 83 K.)

* *H. populnea*. New Zealand Ribbon Wood. 30. July. E. Ls. ov., 5, firm, edged with sharply pointed, unequal teeth. Petals narrow, oblong. Seed-pod winged. New Zealand.

Variety *angustifolia*. Ls. lanc., 2.

Variety *lanceolata* (*H. sexstylosa*). Ls. lanc., 4. (Fig. 83 G)

LAVATERA ARBOREA. Tree Mallow. 8. July–September. D. Ls. ov., 9, palmately nerved at base, lobed, covered with soft hairs, heart-shaped base. Fls. $1\frac{1}{2}$, purple, each petal with blotch of purple veins at base. Europe. (Fig. 29 A.)

* *PLAGIANTHUS BETULINUS*. 40. April-May. D. Very twiggy when young. Ls. ov., 1½-3, toothed, often lobed, slender-stalked Fls small, greenish yellow, in terminal panicles New Zealand. (Fig. 83 F.)

Family 24. *STERCULIACEAE* K₅, Co, A (5), G (5)

* *BRACHYCHITON* (*STERCULIA*) *ACERIFOLIUM*. Flame Tree. 100. E. Ls. alternate, ov., 6, 3-7-lobed, hairless, long-stalked. Fls. 1, red, in axillary racemes or panicles Fruit a large dry pod. Australia. (Fig. 29 H)

FREMONTIA CALIFORNICA 30 May-July. D. Ls. alternate or in clusters, ov., 4, 3-7-lobed or almost entire, dark green above, speckled with star-shaped hairs when young, white- or brown-felted below. Fls. 2½, yellow, solitary on short stalk California (Fig. 29 J)

Family 25. *TILIACEAE*. K₄₋₅ or (4-5), C₄₋₅, A ∞, G (2-5)

ARISTOTELIA. Ls. mostly opposite or sub-opposite, sometimes alternate, ov., 5, pointed, toothed. Fls. very small, in axillary branched clusters or panicles, unisexual and the sexes on different plants. Fruit ¼, a purplish-black berry.

* *A. Macqui* 10. June. E. Ls. finely toothed, dark glossy green, hairless. Fls. greenish white New Zealand (Fig. 59 B)

* *A. racemosa* 25. May. D. Ls. thin, coarsely and unevenly toothed, green and scurfy above, tinged with bronze below. Fls. rose-coloured. New Zealand. (Fig. 59 A.)

* *ELAEOCARPUS CYANEUS*. 50. Summer. E. Ls. alternate, ov., 2, pointed, distantly toothed, leathery, net-veined Fls. ¼, white, in axillary racemes. Fruit ½, a blue berry. Australia. (Fig. 83 J.)

TILIA. Lime. Linden Basswood. Ls. alternate, usually in two opposite rows, roundish, ov., toothed, heart-shaped or straight base, long-stalked. Fls. small, yellowish or whitish, crowded into a small head the stalk of which grows from a large strap-shaped bract. Fruit ½, dry, round, or egg-shaped, 1-3-seeded. First seedling leaves palmately lobed.

(a) *Ls. green below*

T. americana (*T. glabra*). American Lime. 120. July. D. Branchlets green, hairless. Ls. broadly ov., 7, teeth large and long-pointed, axil tufts below except at base. East North America.

T. cordata (*T. macrophylla*, *T. parvifolia*). Small-leaved Lime. 80. June-July. D. Ls. nearly circular, 2, abruptly pointed, sharply and finely toothed, hairless except for brown tufts in vein-axils below, heart-shaped base. Europe and North Asia. (Fig. 84 B.)

T. dasystyla (*T. euchlora*). 80. July. D. Branchlets hairless, red. Ls. broad, ov., 6, glossy above, pale axil tufts below, unequally heart-shaped base, coarsely bristle-toothed. Caucasus.

T. platyphyllos. Large-leaved Lime. 100. June-July. D. Branchlets hairy. Ls. roundish ov., 5, abruptly pointed, hairy, sharply toothed, unequally heart-shaped base, no axil tufts. Europe. (Fig. 84 A.)

TILIA—continued

Variety *asplenifolia* (*T. laciniata*). Smaller tree. Ls. deeply and unevenly lobed, tapering or rounded base. (Fig. 29 D.)

Variety *corallina*. Red-twigged Lime. Branchlets red

Variety *pyramidalis*. Narrow form

Variety *vitifolia* Ls slightly 3-lobed, less hairy.

T. vulgaris (*T. europaea*). Common Lime 100. June–July D Branchlets hairless. Ls. nearly circular, 4, abruptly pointed, base heart-shaped or straight, sharply and finely toothed, hairless except for pale tufts in vein-axils below. Hybrid of the above two. (Fig. 84 C.)

(b) *Ls white below*

T. petiolaris (*T. argentea*) Weeping Lime 80 July. D. Branches drooping; young branchlets densely hairy Ls roundish ov, 4, evenly and sharply toothed, slightly hairy above East Europe. (Sport of *T. tomentosa*.)

T. tomentosa (*T. argentea*) White Lime. 100. July. D. Like above, but branches erect. East Europe

TRICUSPIDARIA. Ls. alternate, sometimes opposite, leathery, distantly toothed, short-stalked. Fls bell- or urn-shaped, drooping from long stalks, solitary in l.-axil. Fruit 1, a capsule containing numerous large black seeds, covered with a thin, semi-transparent white coat.

T. dependens. 30. May and again in September. E. Young shoots reddish. Ls. ov., 3, shallowly toothed, dark green and hairless above, much paler below, stalk reddish. Fls. $\frac{3}{4}$, white, bell-shaped, petals five, fleshy, 3-toothed at ends. Chile. (Fig. 84 F)

T. lanceolata (*Crinodendron Hookerianum*). 20. May–June. E. Ls. lanc., 5, pointed, sharply and distantly toothed, margins often recurved. Fls. $\frac{3}{4}$, crimson, urn-shaped. Chile. (Fig. 84 E.)

Family 26. LINACEAE. K₅, C₅, A₅, G̅ (5)

LINUM ARBOREUM. Tree Flax. 2. May–June. D. Ls. alternate, oblanc., 2, bluish white with purple midrib, often crowded in rosette-like tufts. Fls. 1½, yellow, in erect terminal panicles. Greece. (Fig. 51 F.)

✦ Family 27. RUTACEAE. K₄₋₅, C₄₋₅, A₈₋₁₀, G̅ (4-5)

Ls. usually with prominent midrib and transparent dots.

*ACRADENIA FRANKLINIAE. 12. May. E. Ls. opposite, 3-fol., short-stalked; lfts. lanc., 2½, round-toothed in outer half, hairless, dark green above, pale bright green below, dotted with oil glands. Fls. ½, white, petals five, in terminal branched clusters. Tasmania. (Fig. 1 D.)

*ADENANDRA UNIFLORA. 2. April–May. E. Ls. alternate, linear, lanc., $\frac{3}{4}$, dark glossy green above, dotted with oil glands below, margins hairy. Fls. 1, white, petals five; in few flowered terminal clusters. South Africa. (Fig. 50 Q.)

AEGLE SEPIARIA (CITRUS TRIFOLIATA). Hardy Orange. 12. May–June. D. Stem with spines in l.-axils. Ls. 3-fol.; lfts. lanc., 2, entire; l.-stalk winged Fls. 2, white,

in spine axils before ls Fruit $1\frac{1}{2}$, like a small orange in colour and shape. China and Japan. (Fig. 3 A)

CHOISYA TERNATA Mexican Orange Blossom 10. June–November. E. Ls. opposite, 3-fol, stalk grooved; lflets. obov, oblanc, 3, entire, hairless, stalkless, or nearly so, aromatic when crushed. Fls. 1, white, fragrant, in terminal clusters. Mexico. (Fig 1 E)

**CORREA SPECIOSA* (MAGNIFICA) 4. August–October E. Branchlets and under side of ls covered with brown scurf Ls opposite, roundish ov, 1, entire, gland-dotted, dark green above, tawny below Fls 1, yellowish white, K₄, C₄, A₈; solitary at end of shoot. Australia. (Fig 66 c)

EVODIA Small trees with smooth bark Ls opposite, pinnate; lflets ov., 5, entire or with faint signs of teeth, pointed, stalkless or nearly so Fls very small, creamy white, fragrant, in terminal panicles Seed-pod $\frac{1}{2}$, with short hooked beak.

E. Damellu. 30. August D Lflets. with long hairs on midrib below, stalkless. North China. (Fig 7 A)

E. hupehensis. 30. August D. Lflets. with short hairs on midrib below, or none; distinctly stalked West China.

ORIXA JAPONICA 10. April–May. D Ls alternate, ov., 4, entire or very faintly toothed, short-stalked, spicy odour when crushed Fls. $\frac{1}{2}$, unisexual, greenish, K₄, C₄, sexes on different plants; male fls in short racemes on previous year's wood, female solitary Fruit $\frac{3}{4}$, brown, of four flattened 1-seeded carpels. Japan. (Fig. 116 F.)

PHELLODENDRON Ls opposite, pinnate, aromatic. Bud completely enclosed in base of l.-stalk. Fruit a black berry.

P. amurense. Amur Cork Tree. 30. June. D Bark corky. Lflets. ov., $4\frac{1}{2}$, entire or very faintly toothed, long-pointed, margin fringed with hairs, dark green and glossy above, nearly hairless below. Fls. small, yellowish green, inconspicuous, in terminal panicles, sexes on different trees. Berry $\frac{1}{2}$, smelling of turpentine when crushed. North China. (Fig. 7 D.)

P. japonicum. 20. June. D. Like above, but bark thin and lflets. hairy below, and not glossy. Japan

PTELEA TRIFOLIATA. Hop Tree. 15. June. D. Bark fawn-coloured. Ls. alternate, 3-fol.; lflets. ov, 4, faintly toothed, dark green and glossy above, pale and downy below, stalkless or nearly so. Fls. small, greenish white, in terminal branched clusters at end of short side shoots. Fruit 1, winged (elm-like), 2-seeded. U.S.A. (Fig. 2 c.)

RUTA GRAVEOLENS. Common Rue. 3. July–August. D. Ls. alternate, 4, 2-pinnately dissected, bluish green, hairless, aromatic. Fls. $\frac{3}{4}$, dull yellow, petals concave with fringed margins, in terminal branched clusters. Seed-pod 4-5-lobed, many-seeded. South Europe. (Fig. 36 F.)

SKIMMIA. Ls. alternate, entire, leathery, hairless, aromatic, grouped radially. Fls. small, in terminal panicles. Fruit a red berry.

S. Fortunei. 2. April. E. Ls. lanc., 4, pointed, dark green above. Fls. $\frac{1}{2}$, white. Berry dull crimson. China.

Variety *argentea.* Ls. with white margin.

S. japonica. 4. April. E. Ls. ov., 4, bright green above. Fls. $\frac{1}{2}$, yellowish

SKIMMIA—continued

white, 4-parted, unisexual, sexes on different plants. Berry bright red. Japan (Fig 116 H)

S. Laureola. 3. April E. Ls lanc, 6, dark green above, more prominently veined than above two, very aromatic Fls. $\frac{1}{2}$, yellow, 5-parted. Berry red. Himalaya (Fig 116 J.)

ZANTHOXYLUM. Stem with pairs of spines below stipules. Ls. alternate, pinnate; lflets. finely toothed Fls. small, in axillary clusters on previous year's wood Fruit $\frac{1}{4}$

* *Z. alatum*. 12. June. D Lflets. lanc., 4, terminal one the largest, common stalk broadly winged Fls. yellowish. Fruit red, warted, strongly aromatic, seeds black and shining India. (Fig. 9 E)

Z. americanum. Toothache Tree, Prickly Ash 10. April D. Lflets. ov., $2\frac{1}{2}$. Fls. yellowish green, appearing before ls Fruit blackish. U S.A. (Fig. 9 F.)

Z. piperitum. Japan Pepper. 12. June D. Prickles slender. Lflets., ov., $1\frac{1}{2}$, notched at apex, distinctly toothed. Fls. greenish. Fruit reddish black. China and Japan. (Fig 9 G.)

Family 28. **SIMARUBACEAE**. K₃₋₇ or (3-7), C₃₋₇, A₆₋₁₄, G̅ (4-5)

AILANTHUS. Tree of Heaven Ls alternate, pinnate, spreading palm-like from end of branch; lflets. lanc., with a few coarse teeth near base. Fls. small, greenish, in large terminal panicles, sexes usually on different trees. Fruit $1\frac{1}{2}$, oblong, dry, winged, reddish brown.

A. glandulosa. 70. July. D. Lflets. 4, hairless China. (Fig. 10 H)

A. Vilmoriniana. 50. July. D Lflets. 6, hairy, stalk often red and prickly. China.

* **CNEORUM TRICOCCUM**. 2. Summer. E. Stems erect, forking. Ls alternate, linear, lanc., 2, ending in tiny abrupt point, greyish green, midrib raised on upper side, hairless. Fls. small, yellow, in few-flowered terminal or axillary clusters. Fruit $\frac{1}{2}$, brownish red, 3-lobed, each lobe about size of pea. Mediterranean region. (Fig. 53 H.)

PICRAMMA AILANTHOIDES. 40. May-June. D. Branches reddish brown with yellow spots. Ls. alternate, pinnate, spreading palm-like from end of branch. Lflets. ov., 5, finely toothed, hairless, glossy green above, unequal-sided at base; common l.-stalk grooved. Fls. small, green, in axillary panicles. Fruit $\frac{1}{2}$, berry-like, red, supported by persistent sepals. China and Japan. (Fig. 9 J.)

Family 29. **MELIACEAE**. K (4-5) or 4-5, C₄₋₅, A₈₋₁₀, G̅ (2-5)

CEDRELA SINENSIS. 70. June. D. Bark scaly or shredding. Ls. alternate, pinnate, long-stalked; lflets. lanc., 5, entire or vaguely and distantly toothed, hairless between veins, short-stalked. Fls. small, white, in large terminal panicles. Seed-pod 1, pear-shaped, seeds winged. China. (Fig. 10 B.)

* **MELIA AZEDARACH**. Bead Tree. China Tree. 40. June. D. Bark furrowed. Ls. alternate, 2-pinnate; lflets. ov., 2, unevenly toothed or lobed, hairless, stalked. Fls. $\frac{3}{4}$, lilac, in large axillary panicles. Fruit $\frac{3}{4}$, a round yellow berry. India. (Fig. 21 E.)

Family 30 *OLACACEAE* K4-6, C4-6, A8-12, G2-5

* *VILLARESIA MUCRONATA* 60 June. E. Branchlets ribbed, downy. Ls. alternate, ov., $3\frac{1}{2}$, leathery, dark glossy green, heart-shaped base, hairless, spiny on young trees, stalk very short. Fls. small, yellowish white, K5, C5, in panicles of densely crowded clusters. Chile. (Fig. 84 G)

Family 31 *AQUIFOLIACEAE* K4, C4, A4, G (4)

ILEX Ls. alternate. Fls. small, usually in small axillary clusters. Fruit a berry.

(a) *Ls. evergreen, leathery*

I. Aquifolium Common Holly 80. May E Trunk and branches green. Ls. ov., 3, glossy, hairless, spine-tipped and often with large spiny teeth and wavy margins. Fls. $\frac{1}{2}$, greenish white, in few-flowered axillary clusters, often unisexual, sexes usually on different plants. Berry $\frac{1}{2}$, red, remaining on tree through winter. Europe (including Britain). (Figs. 85 A and 117 A)

A large number of varieties in cultivation, many with variegated leaves.

I. dipyrrena. Himalayan Holly. 40 May Branchlets angular. Ls. lanc., 5, entire or with short marginal spines, dull green above, very shortly stalked. Fls. $\frac{1}{4}$, white, in axillary clusters, unisexual. Berry $\frac{1}{2}$, red. Himalaya. (Fig. 84 K.)

I. glabra (*Prinos glaber*) Inkberry. 6. July. Branchlets angular. Ls. obov., oblanc., $1\frac{1}{2}$, toothed near apex, dark glossy green above, hairless. Berry black. East United States. (Fig. 84 H.)

* *I. insignis*. 30. May Branchlets stout, silver-grey, lustrous. Ls. lanc., 9, spiny or vaguely toothed, dull dark green above with prominent midrib, prominently veined below, stalk purplish. Berry red. East Himalaya. (Fig. 85 E)

I. integra. 30. June. E Branchlets angular. Ls. ov., 4, entire, blunt-ended, dark glossy green above, pale green below. Berry $\frac{1}{2}$, red. Japan.

I. latifolia. Tarajo. 50. June. Branchlets very stout, angular, hairless. Ls. oblong, lanc., 8, shallowly toothed. Berry red. Japan. (Fig. 85 C.)

I. opaca. American Holly. 40. June. Like common holly, but veins conspicuous on lower side and l.-stalk grooved. Berry red, solitary. East United States.

I. Pernyi. 30. May. Branches stiff and densely covered with ls. Ls. ov., 2, dark glossy green, with a few spines on each side. Fls. pale yellow, in dense stalkless clusters. Berry red. China. (Fig. 85 B.)

(b) *Ls. deciduous, thin*

I. verticillata (*Prinos canadensis*). Winter Berry, Black Alder. 10. June-July. Ls. ov., lanc., 3, shallowly and often double-toothed, downy below, prominently veined. Berry red. North America. (Fig. 84 J.)

NEMOPANTHUS MUCRONATA (*ILEX CANADENSIS*). Mountain Holly. 10. May. D. Branches slender, hairless. Ls. alternate, ov., $1\frac{1}{2}$, bright green turning yellow, entire or slightly toothed, slender-stalked. Berry dull red. Canada. (Fig. 85 D.)

Family 32. *CYRILLACEAE* K₅, C₅, A₅+₅, G̅ (2-5)

CLIFTONIA MONOPHYLLA Buckwheat Tree. 25. April E. Ls alternate, lanc., 2, entire, tapering base, dark green above, hairless. Fls small, white or pinkish, fragrant, in terminal racemes up to 2½ long Fruit ¼, egg-shaped, 3-4-winged (like buckwheat). South-east United States

CYRILLA RACEMIFLORA Leatherwood 4 September. D Ls lanc, 4, entire, much tapered at base, hairless, dark glossy green, lateral veins numerous and close together. Fls. very small, white, crowded in long axillary spikes forming a whorl at base of young wood South United States. (Fig. 117 B)

Family 33. *CELASTRACEAE*. K₄₋₅ or (4-5), C₄₋₅, A₄₋₅, G̅ (2-5)

CELASTRUS. Climbers. Ls alternate, ov., round-toothed. Fls. small, greenish yellow, in terminal or axillary clusters. Seed-pod 3-celled, yellow inside, containing red seeds.

C. angulatus (*C. latifolius*). 20 June D Stems angular, corky in second year. Ls. 7, hairless. Fls. in terminal clusters. China.

C. articulatus 30. June D. Stems cylindrical; pair of spines at each bud when young. Ls. 4. Fls. in axillary clusters. Japan. (Fig 85 F.)

C. scandens. Staff Tree, Waxwork. 20. July D. Stems cylindrical. Ls. 4. Fls. in terminal clusters North America (Fig. 85 G.)

* *ELAEODENDRON CAPENSE*. 10. July-August. E Ls. opposite or sub-opposite, ov, 2½, distantly toothed, hairless. Fls small, green, 4-parted, in axillary branched clusters. Fruit ½, egg-shaped, yellow, fleshy and containing a hard nut South Africa (Fig. 59 F)

EUONYMUS. Spindle Tree. Young branchlets usually 4-angled. Ls. opposite, minutely toothed. Fls small, in axillary clusters. Fruit with four or five orange or red fleshy lobes, each holding one or two large orange- or red-coated seeds.

(a) *Ls deciduous*

E. americanus. Strawberry Bush. 6 June. Ls. lanc., 3 Fruit 3-5-lobed, pink, covered with prickly warts, seeds red-coated. U.S.A.

Variety *angustifolius*. Ls. linear, lanc. ½ E.

E. alatus. Winged Spindle Tree. May-June. Branchlets with corky wings. Ls. ov., 1½. Fruit of nearly separate lobes with orange-coated seeds. China and Japan.

E. atropurpurea. Burning Bush. 25. May-June. Ls. ov., 4, downy. Fls. purple, seven to fifteen on a stalk. Fruit 4-lobed, crimson, seeds scarlet-coated. U.S.A.

E. europaeus. Common Spindle Tree. 25. May. Ls. ov., lanc., 3½. Fruit 4-lobed, red, seeds orange-coated. Europe (including Britain). (Fig. 60 G.)

E. latifolius. 10. May. Ls. ov., 4, stalk grooved. Fruit 4-5-lobed, bright red, larger than above, drooping on long slender stalk. Europe and Asia. (Fig. 60 F.)

E. planipes. 25. June. Ls. obov., 4, stalk not grooved. Fruit 5-angled. Japan.

EUONYMUS—continued

(b) *Ls evergreen*

E. japonicus 15 July–August Branchlets bright green. *Ls.* ov., 3, leathery, glossy, round-toothed, each tooth tipped with black gland; often rounded or notched at apex Fruit pinkish. Japan (Fig 60 D.)

Variety *albo-marginatus* *Ls.* with thin white margin

Variety *aureus*. *Ls.* bright yellow in middle.

Variety *latifolius-variegatus*. *Ls.* broad with broad white margin.

Variety *ovatus aureus*. *Ls.* with broad yellow margin.

E. pendulus (*E. fimbriatus*). 20 June. *Ls.* lanc., 5, leathery, glossy, pointed, sharply toothed, hairless. Fruit 4-lobed Himalaya (Fig. 60 E)

E. radicans Trailing and rooting, or climbing with aerial roots 25. June. Branchlets nearly cylindrical, warted *Ls.* ov., 1½, dull green above with pale broad veins. Fruit pinkish Japan (Fig 60 H.)

Variety *folius variegatus*. *Ls.* with broad white margin.

Variety *Silver Queen* *Ls.* variegated with white

* MAYTENUS CHILENSIS. 25. E. Branchlets long and slender. *Ls.* alternate, ov., lanc., 2, pointed, leathery, finely toothed, short-stalked. Fls. small, yellowish green, 5-parted, in axillary clusters. Seed-pod 2-celled, containing four red seeds. Chile. (Fig. 86 A)

PACHYSTIMA Low evergreen shrubs. Branchlets 4-angled, warted. *Ls.* opposite, ov., lanc., 1, toothed at outer end or entire, hairless, margins often recurved. Fls. very small, reddish, in axillary clusters. Seed-pod ¼, leathery, whitish, 2-celled.

P. Canbyi. 1½ April–May. *Ls.* linear, lanc. North Carolina, Virginia.

P. Myrsinites. 1½. May–August. *Ls.* broader. West North America. (Fig. 56 N.)

TRIPTYERYGIUM WILFORDII. 6 July–August D. Branchlets long, reddish brown, warted. *Ls.* alternate, roundish ov., 6, round-toothed, slender-pointed, light green, hairless, stalk ½ to 1 Fls. small, yellowish white, in large terminal panicles Fruit 3-winged, 1-seeded China and Japan. (Fig 86 B)

Family 34 RHAMNACEAE. K4-5, C4-5 or 0, A4-5, G (2-3)

Ls. with stipules or stipular spines. Stamens opposite the petals, which are often less conspicuous than the sepals.

BERCHEMIA. Climbers *Ls.* alternate, ov., entire, with numerous parallel veins. Fls. small, greenish white, in terminal panicles. Fruit a sausage-shaped black berry.

B. flavescens. 10. June–July. D. Branchlets slender, with dark outstanding hairs (Bean). *Ls.* 6, rounded or broadly tapered at base, smooth metallic green above, 9-16 pairs parallel veins. East Himalaya.

B. racemosa. 15. July–September. D. *Ls.* 2½, somewhat glaucous below, 6-8 pairs parallel veins. Fruit egg-shaped. Japan.

B. volubilis (*B. scandens*). Supple Jack. 15. June. D. *Ls.* 3, rounded at base, 9-12 pairs parallel veins. South United States. (Fig. 117 C.)

CEANOTHUS Mountain Sweet. Fls. small, 5-parted (buds star-shaped), in small clusters forming spikes or panicles, sepals curved inwards, the petals spreading outwards from between them. Seed-pod round or top-shaped, 3-lobed at end.

(a) *Ls. 3-nerved, alternate*

- C. americanus* New Jersey Tea 3 June–August. D. Ls. ov., 3, bright green, downy below. Fls. white, in terminal panicles. East United States. (Fig. 86 c.)
- * *C. azureus*. 6. July–September. D. Ls. ov., 2, white-felted below. Fls. blue Mexico
- * *C. Delilianus*. 6 July–September. D. Like *C. americanus*, but fls. blue. Hybrid. (Fig. 86 g.)
- Variety *Gloire de Plantières* Fls. deep blue.
 Variety *Gloire de Versailles*. Fls. bright blue.
 Variety *Léon Simon* Fls. dark blue
 Variety *Victor Joun.* Fls. pale blue
- C. pallidus*. 3 July–September D. Like *C. Delilianus*, but ls. nearly hairless. Fls. pale blue or pink. Hybrid.
- C. thyrsiflorus*. Californian Lilac. 30. June–August. E. Branchlets angular. Ls. ov., 2, glossy above, pale green below. Fls. pale blue (sometimes white), in lateral racemes. California. (Fig. 86 d.)
- * *C. Veitchianus*. 12. June–August. E. Like *C. thyrsiflorus*, but ls. smaller and 3-nerved at base only. California (hybrid) (Fig. 86 f.)

(b) *Ls. pinnately nerved*

- * *C. dentatus*. 6. May E. Ls. alternate, ov., 1 Fls. bright blue. California. (Fig. 86 e.)
- Variety *floribundus* (*C. floribundus*). More floriferous.
- * *C. papillosus*. 12 May. E. Ls. alternate, oblong, lanc, 2, conspicuously warted, margins recurved. Fls. blue California.
- C. prostratus*. $\frac{1}{2}$. May. E Ls. opposite, 1, spiny and leathery. Fls. blue. California. (Fig. 54 m.)
- * *C. rigidus*. 12. April–May. E. Ls. opposite, obov., $\frac{1}{2}$, coarsely toothed, white below or white between veins, much crowded on stiff branches. Fls. deep purplish blue. California. (Fig. 56 m.)

COLLETIA. Stems green, furnished with opposite spines. Ls. very small or absent. Fls. small, white, solitary or in few-flowered clusters below spines. Fruit a dry pod.

- C. armata*. 10. September. Spines straight, cylindrical. Chile. (Fig. 37 g.)
- C. cruciata*. 10. September. Spines triangular, flattened. Chile. (Fig. 37 h.)
- C. infausta*. 10. May. Spines cylindrical, slightly curved. Chile.

DISCARIA. Stems with opposite spines. Ls. opposite or in clusters, 1 or less. Fls. small, greenish white, crowded in axillary clusters. Seed-pod 3-lobed.

- D. serratifolia*. 14. May D. Branches long, slender, drooping. Spine $\frac{3}{4}$. Ls. toothed. Chile. (Fig. 54 f.)
- * *D. Toumatou*. Wild Irishman. May. D. Spine $1\frac{1}{2}$. Ls. entire. New Zealand. (Fig. 54 e.)

HOVENIA DULCIS. Japanese Raisin Tree. 30. June–August. D. Ls. alternate, broadly ov., 6, 3-nerved at base, coarsely toothed, unequal-sided at base, hairless, long-stalked. Fls. $\frac{1}{2}$, greenish, in branched clusters. Fruit $\frac{1}{4}$, fleshy, edible. India, China, and Japan. (Fig. 86 H)

PALIURUS SPINA-CHRISTI (P. ACULEATUS, P. AUSTRALIS). Christ's Thorn. 20. July. D. Ls. alternate, ov., $1\frac{1}{2}$, 3-nerved at base, minutely toothed or entire, slender-stalked, in two opposite rows; two unequal thorns at base of each l. Fls. small, greenish white, in axillary clusters on new wood. Fruit dry, winged. South Europe. (Fig. 87 F)

* POMADERIS ELLIPTICA 8. May. E. Branchlets and underside of ls. covered with grey or tawny wool. Ls. alternate, ov., 3, entire, prominently veined below. Fls. $\frac{1}{4}$, yellow, in terminal panicles. Fruit a small capsule. New Zealand. (Fig. 86 J.)

RHAMNUS. Branches often with thorns. Ls. usually alternate. Fls. small, greenish yellow or white, in axillary clusters or racemes. Fruit a black berry.

(a) *Ls. with numerous parallel veins*

R. crenata. 10. June. D. Young shoots with rusty down. Ls. alternate, ov., lanc., 4, minutely toothed, 7–12 pairs parallel veins. Japan (Fig. 87 D.)

R. Frangula. Berry-bearing Alder, Alder Buckthorn. 18. June. D. Young branchlets spotted. Ls. alternate, ov., 3, entire, 8–9 pairs parallel veins. Europe (including Britain) (Fig. 117 D.)

Variety *asplenifolia*. Ls. linear, margins wavy.

R. imeritina. 10. June. D. Branchlets stout. Ls. ov., oblong, 10, minutely toothed, dark green above, downy below, 15–30 pairs parallel veins. West Caucasus (Fig. 87 E.)

R. Purshiana. Cascara Sagrada. 50. May–June. D. Young shoots very downy. Ls. ov., oblong, 5, minutely toothed, 10–15 pairs parallel veins. California. (Fig. 87 C.)

(b) *Ls. without numerous parallel veins, often
3-nerved at base*

R. Alaternus. 12. March–April. E. Ls. alternate, ov., 2, tapered at both ends, toothed, dark glossy green. South-west Europe. (Fig. 87 A.)

Variety *angustifolia*. Ls. lanc. (Fig. 87 B.)

Variety *variegata*. Ls. with white margin.

R. cathartica. Common Buckthorn. 20. May–June. D. Branchlets hairless, often ending in spine. Ls. opposite or sub-opposite, ov., $2\frac{1}{2}$, toothed, slender-stalked. Europe (including Britain). (Fig. 54 J.)

ZIZYPHUS SATIVA (Z. VULGARIS) Jujube. 30. June. D. Like *Paliurus*, but fruit an edible berry. South-east Europe to India. (Fig. 87 G.)

Family 35. AMPELIDACEAE. K (4–5), C4–5, A4–5, G (2)

VITIS. Climbing by tendrils or suckers. Ls. alternate, digitate or pinnate, or palmately lobed or veined, coarsely toothed, pointed. Fls. small, in branched clusters or panicles which are usually opposite a l. Fruit a berry.

VITIS—continued

(a) *Tendrils with adhesive disks*

- V. Henryana* (*Parthenocissus Henryana*) July. D. Stems angled. Ls. 3-fol. or digitate; lfts ov, $2\frac{1}{2}$, velvety, variegated with silver and pink along veins China.
- V. inconstans* (*Ampelopsis Veitchii*, *Parthenocissus tricuspidata*). 60. June-July. D. Tendrils very short, with large disks Ls. very variable in shape and size, 3-lobed or 3-fol. China and Japan. (Fig 30 F)
- V. quinquefolia* (*Ampelopsis hederacea*, *Parthenocissus quinquefolia*). True Virginia Creeper. 100 July-August. D. Tendrils long and slender Ls. digitate (5-fol.), lfts ov, 4. East North America (Fig 4 D.)
- V. semicordata* (*V. himalayana*, *Parthenocissus himalayana*). D. Ls 3-fol, lfts ov, 5, lateral ones unequally heart-shaped at base. Himalaya.
- V. Thomsonii* (*Parthenocissus Thomsonii*) D Young stems and ls. purple. Tendrils long and slender Ls. digitate. Himalaya.

(b) *Tendrils without adhesive disks*

- V. arborea*. Pepper Vine. 30. August. D. Stems hairless. Ls. 2-pinnate; lfts ov., $1\frac{1}{2}$, coarsely toothed. South United States.
- V. Coignetiae* (*V. Kaempferi*). 100. June-July. D Young stems ribbed, woolly. Ls ov, 12, vaguely 3-5-lobed, brown-felted below. Japan. (Fig 30 E.)
- V. Davidii* (*V. armata*). June-July. D. Stems and l-stalks prickly. Ls. heart-shaped, 10, dark green above, glaucous below. China.
- V. heterophylla* (*Ampelopsis heterophylla*) July-August. D. Stems hairless, and l-stalks reddish. Ls very variable in shape and size, ov., often 3-5-lobed, heart-shaped base, glossy below. Berry porcelain-blue with black dots (Bean) China and Japan.
- Variety *variegata*. Ls tinged with pink and white.
- V. Labrusca*. Fox Grape June. D. Tendril opposite each l. or fl.-cluster. Ls. ov, 6, 3-lobed towards top, thick, strongly veined, white- or tawny-felted below. New England to Georgia
- V. (Ampelopsis) megalophylla* 30 August. D. Stems hairless. Ls. 2-pinnate; lfts. ov., 4, coarsely toothed, veins ending in teeth, stalked. West China (Fig. 22 B)
- V. vinifera* Grape Vine. June. D Bark peeling. Ls. roundish ov., 6, 3-5-lobed, spaces between lobes rounded, lobes coarsely toothed and usually overlapping, often hairy or cobwebby below, stalk more than half as long as blade. Caucasus. (Fig. 31 A.)
- Variety *laciniosa* (*apiifolia*) Parsley-leaved Vine. Ls. deeply 3-5-cleft, with deeply cut subdivisions.
- Variety *purpurea*. Teinturier Grape. Ls. purple.
- V. vitacea* (*Parthenocissus vitacea*). Common Virginia Creeper. June-July. D. Like *V. quinquefolia*, but without adhesive disks. East North America.

Family 36. *SAPINDACEAE*. K4-5 or (4-5), C4-5, A4-10, G (3)

AESCULUS. Horse Chestnut. Ls. opposite, digitate. Fls. showy, in upright panicles. Fruit 3-parted, with one or more very large seeds (chestnuts).

AESCULUS—continued

(a) *L-buds resinous*

- A. carnea*. Red Horse Chestnut 80 May D Lfts obov., 6, coarsely double-toothed, green below, short-stalked Fls flesh-coloured to deep red. Fruit with a few small prickles Hybrid
- A Hippocastanum*. Common Horse Chestnut 100. May D Lfts obov, oblanc, 9, coarsely double-toothed, green below, stalkless. Fls. white tinged with yellow or red. Fruit very prickly Europe (Fig. 4 A.)
Variety *flore pleno* Fls double.
Variety *rosea* Fls pink.
- A indica* Indian Horse Chestnut 100 June-July D Bark twisted, peeling off in long strips Lfts lanc, 9, finely single-toothed, stalked Fls. white tinged with yellow or red Fruit rough, not prickly. West Himalaya. (Fig 4 B)
- A turbinata* Japanese Horse Chestnut. 100 May D. Lfts obov., oblanc, 16, evenly round-toothed, stalkless Fls white. Fruit pear-shaped, warty. Japan

(b) *L-buds not resinous*

- A octandra* (*A flava*) Sweet Buckeye. 90. May-June D. Bark smooth, with horizontal scars Lfts ov., 7, finely single-toothed, downy below. Fls yellow Fruit smooth East United States
Variety *sanguinea* Fls scarlet.
Variety *rosea* Fls deep rose
Variety *purpurea* Fls purple and red
- A parviflora* (*Pavia macrostachya*). Shrubby Pavia 12 August. D. Lfts. obov, 8, finely round-toothed, greyish white down below Fls. white, with red stamens. Fruit smooth South-east United States. (Fig 4 c.)
- A. Pavia* (*Pavia atropurpurea*) Red Buckeye. 12. June. D. Bark smooth Lfts. oblanc, 5, sharply and often double-toothed, green below. Fls. red Fruit smooth South United States.

KOELREUTERIA PANICULATA. Pride of India. 60. July-August. D. Ls. alternate, pinnate or 2-pinnate; lfts. ov., 3, unevenly toothed, often lobed. Fls $\frac{1}{2}$, yellow, in large terminal panicles. Fruit 2, inflated, with papery walls, containing three black seeds. China. (Fig 19 A.)

SAPINDUS DRUMMONDII. Soapberry, Wild China Tree. 30. May-June. D. Bark reddish brown, scaly. Ls. alternate, pinnate, without terminal lft; lfts. lanc., $2\frac{1}{2}$, entire, pointed, unequal-sided, downy below. Fls. $\frac{1}{2}$, yellowish white in loose downy panicles up to 9 long. Fruit $\frac{1}{2}$, a semi-transparent berry at first yellow and then black. South United States. (Fig. 11 J.)

*UNGNADIA SPECIOSA. Mexican Buckeye. 30 April-May. D. Ls. alternate, pinnate; lfts. ov., lanc., 4, toothed, dark glossy green above, light green below. Fls. 1, rose-coloured, in lateral stalked clusters Fruit 2, pear-shaped. South-west United States. (Fig. 17 c.)

XANTHOCERAS SORBIFOLIA. 20. May. D. Branchlets pithy. Ls. alternate, pinnate, 1-stalk channelled; lfts. ov, lanc., 2, deeply and sharply toothed, stalkless. Fls. 1, white, K₅, C₅, A₈, petals with thin yellow or red blotch at base; in erect panicles. Fruit 2, a top-shaped, thick-walled capsule; seeds $\frac{1}{2}$, dark brown. China. (Fig. 12 A.)

Family 37. *ACERACEAE*. K4-5, C4-5 or 0, A8, G (2)

ACER. Maple Ls. opposite, long-stalked, usually palmately lobed. Fls. small, yellowish or greenish, usually 5-parted, in branched clusters or panicles. Fruit 2-winged.

(a) *Ls usually 3-lobed*

- A. crataegifolium*. Hawthorn Maple. 25 April. D. Branchlets purplish. Ls variously shaped, 3, 2-5-lobed, unevenly toothed, bluish green, hairless. Fl panicles erect. China and Japan (Fig. 23 E)
 Variety *Veitchii*. Ls. marbled with rose and white
- A. creticum* (*A. orientale*) Cretan Maple. 15. April $\frac{1}{2}$ E. Ls. $1\frac{1}{2}$, often not lobed, entirely or faintly toothed, hairless, leathery Fls in erect clusters. Wings of fruit parallel. East Mediterranean region (Fig. 24 E.)
- A. Ginnala* (*A. tataricum*, variety *Ginnala*). 20 June. D Branches slender, arching Ls. 3, middle lobe much longer than side ones, round-toothed, hairless. Wings of fruit, nearly parallel China and Japan. (Fig 25 A)
- A. monspessulanum*. Montpellier Maple. 25. May. D. Ls. 2, usually broader than long, base heart-shaped, lobes entire or nearly so. Fls. greenish yellow, in drooping clusters. Wings of fruit spreading at wide angle. South Europe and West Asia. (Fig 23 G)
- A. pennsylvanicum* Moose Wood, Snake-bark Maple. 30 May. D. Branchlets green, striped with white lines. Ls. ov., 3, lobed near apex, double-toothed, heart-shaped base, reddish hairs below when young Fls. yellow, in drooping panicles. Wings of fruit spreading at wide angle. East United States. (Fig. 24 B)
- A. rubrum*. See (b) below.
- A. rufinerve*. 30. May-June. D. Bark smooth, dark green, with long pale vertical stripes. Branchlets bluish white Ls. ov., 5, sometimes vaguely 5-lobed, finely and unevenly toothed, reddish hairs on veins below when young. Fl. panicles erect. China and Japan. (Fig. 23 F.)
- A. tataricum*. Tartarian Maple. Ls. ov., 4, unevenly double-toothed. Fls. greenish white, in long upright panicle Fruit red, wings nearly parallel. East Europe.

(b) *Ls. usually with 5 or more lobes*

- A. campestre*. Common Maple. 35. May. D. Branchlets often corky. Ls. 3, lobes rounded, each with a few rounded teeth or entire, stalk with milky juice. Fls. greenish, in upright clusters. Wings of fruit spreading horizontally. Europe (including Britain). (Fig. 23 D.)
 Variety *postelense*. Ls. golden yellow.
 Variety *pulverulentum*. Ls. speckled with white.
 Variety *Schwerinii*. Ls. purple.
 Variety *variegatum*. Ls. edged with white.
- A. circinatum*. Vine Maple. 30. April-May. D. Bark smooth, red. Ls. almost circular, 5, 7-9-lobed, unevenly toothed. Fls. $\frac{1}{2}$, in small branched clusters, sepals purple, petals white. Wings of fruit spreading horizontally. California. (Fig. 24 C.)
- A. crataegifolium*. See (a) above.

ACER—continued

- A. dasycarpum* (*A. eriocarpum*, *A. saccharinum*). Silver Maple. 120. April. D. Ls. 4, deeply 5-lobed, double-toothed, bright green above, white below. Fls. greenish, without petals. Wings of fruit sickle-shaped. East North America. (Fig. 24 D.)
- A. japonicum* 30 May. D. Ls. roundish, 5, 7-11-lobed, double-toothed. Fls. purple, in long-stalked nodding clusters. Wings of fruit nearly horizontal. Japan (Fig. 25 D.)
- A. laetum* (*A. cappadocicum*) 60. May-June. D. Ls. 5, 5-7-lobed, lobes not toothed. Fls. pale yellow. Caucasus. (Fig. 25 C.)
Variety *colchicum rubrum*. Branchlets reddish. Ls. red when young, green with red margin when older.
- A. macrophyllum*. Oregon Maple. 100 April-May. D. Ls. 12, cut more than half-way to base, stalk milky. California and Oregon (Fig. 24 A.)
- A. palmatum*. Japanese Maple. 25 May. D. Ls. 4, deeply 5-9-lobed; lobes lanc., double-toothed, long-pointed. Fls. purple. Wings of fruit spreading and curved inwards forming a broad arch (Bean). Japan. (Fig. 25 B.)
Variety *atropurpureum*. Ls. purple
Variety *dissectum*. Ls. digitate (see (c) below)
- A. rubrum*. Red Maple. 100 March-April. D. Ls. 4, 3-5-lobed, unevenly toothed, dark glossy green above, white below. Fls. red. Narrow angle between wings of fruit. U.S.A. (Fig. 23 C.)
Variety *sanguineum*. Ls. downy, richer red in autumn. Fls. brilliant red.
- A. saccharum*. Sugar Maple. 100 May. D. Ls. 4, 5-lobed, lobes with a few coarse teeth, light green or glaucous below. Fls. greenish yellow, bell-shaped. Wide angle between wings of fruit. East North America. (Fig. 23 H.)
- A. platanoides*. Norway Maple. 70 April-May. D. Ls. 7, 5-lobed, lobes coarsely and remotely toothed, spaces between teeth rounded, green below, hairless except for tufts in vein-axils below, stalk with milky juice. Fls. greenish yellow, in erect clusters. Fruit drooping, wings nearly horizontal. Europe (Fig. 23 B.)
Variety *aureo-marginatum*. Ls. with yellow margin, sometimes blotched with yellow
Variety *laciniatum*. Eagle's Claw Maple. Ls. with tapering base, lobes curved downwards.
- A. pseudoplatanus*. Sycamore. 100 April-May. D. Ls. 6, 5-lobed, coarsely double-toothed, grey below. Fls. yellowish green, in drooping panicles. Wings of fruit at acute or right angle. Europe (including Britain) and West Asia. (Fig. 23 A.)

(c) *Ls. compound*

- A. griseum*. 40. May-June. D. Bark smooth, shining, copper-coloured, flaking. Ls. 3-fol.; lfts. ov., lanc., $2\frac{1}{2}$, with a few large blunt teeth, blue-grey below. Wings of fruit at acute or right angle. Cochin China. (Fig. 1 B.)
- A. Negundo*. Box Elder. 70. March. D. Ls. 3-fol. or pinnate; lfts. ov.,

ACER—*continued*

lanc., 4, coarsely and unevenly toothed Fls. yellowish green, in drooping panicles appearing before ls. Wings of fruit at acute angle and often curved inwards U S A. (Fig 1 c)

Variety *aureum*. Ls yellow

Variety *variegatum*. Ls. with white margin.

A. palmatum, variety *dissectum*. Japanese Maple 25. May D Ls. digitate, lfts lanc., 4, double-toothed, long-pointed, often pinnately lobed Japan (Fig. 5 B.)

Variety *ornatum*. Ls deep red.

Variety *roseo-marginatum* Ls. rosy at edge.

DIPTERONIA SINENSIS. 25. May. D Ls opposite, pinnate, lfts. lanc, 4, sharply and unevenly toothed, long-pointed Fls small, greenish white, in erect panicles. Wings of fruit nearly circular, elm-like. China (Fig 7 B)

Family 38. STAPHYLEACEAE K5, C5, A5, G (2-3)

Ls. stipulate.

* EUSCAPHIS STAPHYLEOIDES (E. JAPONICA). 12 May-June. D. Branchlets stout, pithy. Ls. opposite, pinnate; lfts. ov., 3, finely toothed, stalked. Fls. small, yellowish white, in terminal panicles Fruit $\frac{1}{2}$, reddish, of three boat-shaped spreading bracts (Bean). Japan. (Fig 7 c.)

STAPHYLEA Bladder Nut. Small deciduous trees. Ls opposite, 3-fol. or pinnate; lfts ov., lanc, finely toothed. Fls. small, white, in terminal panicles. Fruit bladder-like, 2-3-lobed.

S. Bumalda. 6. May. Ls. pinnate; lfts. ov., $2\frac{1}{2}$, middle one short-stalked. Fruit 1. Japan.

S. colchica. 10. May. Ls pinnate; lfts. ov., 3, glossy below. Fruit 4. Caucasus. (Fig. 7 E.)

Variety *Coulombieri*. Larger and more vigorous; fls. smaller.

S. Emodi 10. May. Bark with conspicuous raised white longitudinal stripes. Ls. 3-fol.; lfts ov., 6. Fls in long drooping panicles. Fruit 3. West Himalaya.

S. pinnata. 15. May Ls. pinnate, lfts. ov, 4, sharply toothed. Fls. in terminal drooping panicles. South Europe.

S. trifolia. American Bladder Nut. 15. May. Ls 3-fol; lfts. ov., 4, downy below, middle one long-stalked. Fls. dingy white, bell-shaped, in short drooping panicles. Fruit 3-lobed. North America.

TAPISCIA SINENSIS. 30. July. D. Ls. alternate, pinnate; lfts. ov., 4, pointed, rounded, or heart-shaped base, sharply toothed, glaucous below, hairless, short-stalked. Fls. small, yellowish, fragrant, in axillary panicles or spikes. Fruit $\frac{1}{2}$, a black berry. China. (Fig. 17 D.)

TURPINIA NEPALENSIS. 50. January-June. D. Ls. opposite, pinnate; lfts. ov., 6, leathery, sharply toothed. Fls. very small, in terminal and axillary panicles. Fruit 2, fleshy, green, yellow, or purplish. Himalaya. (Fig. 7 F.)

Family 39 *SABIACEAE*. K (3-5), C₄-5, A₅, G (2)

MELIOSMA. Buds without scales Ls alternate. Fls. small, yellowish white, in large terminal panicles Fruit $\frac{1}{2}$, a purplish-black berry.

M. cuneifolia 20. July. D Ls. simple, obov., 6, tapering base, toothed, with numerous straight veins Fls. in erect panicles. China. (Fig. 84 D.)

M. Veitchiorum. 40. May. D Branchlets stout, erect Ls. pinnate, stalk red and warted at lower end; lfts. ov., 7, deeply veined, teeth few or none, hairless except on midrib below. Fls. in drooping panicles. (Fig. 10 D)

Family 40. *ANACARDIACEAE*. K (3 or more), C₃-7 or 0, A₅-14, G (1)

PISTACIA. Ls. alternate, pinnate; lfts. entire Fls. small, without petals, unisexual, in lateral panicles, sexes on different trees Fruit $\frac{1}{2}$, red to black

P. chinensis. Chinese Pistachia 80 April D Lfts. an even number, ov., lanc., $3\frac{1}{2}$, spicy-scented. China. (Fig. 11 H)

* *P. Lentiscus* Mastic Tree 20. E. Branchlets warted. Lfts. an even number, lanc., $1\frac{1}{2}$, with short abrupt point. Mediterranean region. (Fig. 12 D.)

P. Terebinthus. Chian Turpentine Tree. 30 D Lfts. an odd number, ov., 2, dark glossy green, hairless, resin-scented. South Europe. (Fig. 9 H.)

RHUS. Sumach. Ls alternate. Fls. small, yellow or greenish, 5-parted, in terminal or axillary panicles. Fruit a berry.

(a) *Ls. simple*

R. cotinoides (*Cotinus americanus*) Chittam Wood. 15. June. D. Ls. obov., 5, entire, tapering gradually to base, long-stalked. Fls. greenish yellow, in thin panicles or racemes. Fruiting panicles inconspicuous. South United States. (Fig. 117 F.)

R. Cotinus (*Cotinus coggyria*). Venetian Sumach, Smoke Tree. 12. June-July. D. Ls. ov., 3, entire, rounded or notched at apex, tapering abruptly to base, hairless, strong smelling. Fls. in broad flesh-coloured to smoky grey panicles. Fruiting panicles conspicuous with long, spreading purplish hairs. South Europe. (*R. Cotinus* of Himalayas is downy on under side of ls.) (Fig. 117 E.)

Variety *atropurpurea*. Ls., branchlets, and fls. purple.

Variety *pendula*. Branches drooping.

(b) *Ls. compound*

R. canadensis (*R. aromatica*). Fragrant Sumach. 3. March-April. D. Ls. 3-fol.; lfts. ov., $2\frac{1}{2}$, coarsely toothed, aromatic. Fruit round, red, hairy. North America. (Fig. 2 F.)

R. copallina. Shining Sumach. 30. July-August. D. Ls. pinnate; lfts. ov., lanc., 4, entire or with a few teeth near apex, glossy above, downy below, common stalk winged. Fls. greenish, in dense terminal panicles. Fruit crimson, hairy. East United States. (Fig. 10 G.)

R. glabra. Smooth Sumach. 12. August. D. Branchlets hairless, glaucous.

RHUS—continued

Ls. pinnate; lflets. lanc., 4, toothed, hairless, glaucous below. Fls. greenish, in dense terminal panicles. Fruiting panicles erect, red, hairy, and sticky. U.S.A.

Variety *laciniata*. Lflets. 2-pinnate, or 2-pinnately lobed.

R. Potanini. 25. May–June. D. Branchlets hairless. Ls. pinnate; lflets. ov., lanc., 4, entire (or coarsely toothed in young plants), hairless or nearly so. Fls. whitish, in terminal panicles. Fruiting panicles drooping, dark red, hairy. China.

R. punjabensis. 30. June–July. D. Like *R. Potanini*, but branchlets downy. Himalaya to China.

R. Toxicodendron Poison Ivy. 9. June–July. D. Rambler or climbing by aerial roots. Ls. 3-fol.; lflets. ov., 4, entire or with a few coarse teeth. Fruit a white berry. North America and Japan. (Fig. 3 D.)

R. typhina. Staghorn Sumach. 25. July. D. Branchlets velvety-hairy. Ls. pinnate; lflets. lanc., 5, toothed, long-pointed. Fls. greenish, in dense hairy panicles. Fruiting panicles red, hairy. East United States. (Fig. 10 F.)

Variety *laciniata*. Lflets. pinnately lobed (Fig. 22 C.)

R. verniciflua (*R. vernicifera*). Lacquer Tree, Varnish Tree. 60. July. D. Ls. pinnate; lflets. broadly ov., 6, entire, velvety downy below. Fls. yellowish white, in loose axillary panicles. Fruit a yellowish berry. China and Japan. (Fig. 10 E.)

R. vernix. Poison Sumach. 20. June–July. D. Branchlets hairless. Ls. pinnate; lflets. ov., oblong, 4, entire, hairless. Fls. greenish yellow. Fruit yellowish. East United States.

SCHINUS DEPENDENS. 15. May. E. Branchlets stiff, spine-tipped. Ls. alternate, obov., 1, blunt-ended, tapering to very short stalk, entire or toothed. Fls. very small, C₄, A₈, in small axillary branched clusters. Fruit a purple berry. Chile. (Fig. 87 H.)

Family 41. CORIARIACEAE. K₅, C₅, A₅+5, G₅

CORIARIA. Branchlets 4-angled. Ls. opposite, ov., 3-5-nerved, entire, in two opposite rows. Fls. small, greenish, in racemes; petals enlarge and become fleshy, enclosing the black fruit.

(a) *Fls. in terminal racemes*

C. terminalis. 3. June. D. Semi-herbaceous. Ls. ov., 3, 5-9-nerved, abruptly pointed. Himalaya. (Fig. 76 B.)

(b) *Fls. in lateral racemes*

C. japonica. 3. September. D. Stems semi-herbaceous, pithy, renewed annually from base. Ls. 4, 3-nerved, long-pointed, hairless. Japan.

C. myrtifolia. Redoul. 6. Summer. D. Branches erect. Ls. 2½, 3-nerved, hairless. Mediterranean region.

C. nepalensis. 8. April–May. D. Bark rough, reddish brown. Branches spreading. Ls. 4, 3-7-nerved, heart-shaped base. Himalaya.

C. sinica. 15. D. Branchlets warted. Ls. 3, 3-nerved, short-pointed. China.

Family 42. *LEGUMINOSAE*. K_{4-5} or $(4-5)$, C_5 , $A_{4-\infty}$ or $(4-\infty)$, G_1
(Sweet Pea, Vetch, Clover, Pea, Bean)

Ls alternate, stipulate, usually compound. Fruit a dry pod, often elongated and usually splitting along both edges revealing a single row of seeds. Members of this family have the power to make their own nitrogen by tubercles on the root which can usually be seen with the naked eye.

Sub-family *PAPILIONACEAE* K_5 or (5) , C_5 , A_{10} or (10) or $(9)+1$, G_1

Fls usually resemble those of the sweet pea, having standard, wings, and keel.

(I) STAMENS ALL UNITED

ADENOCARPUS DECORTICANS 10 May-June. D Branches long, horizontal. Ls 3-fol, crowded, slender-stalked; lflets linear, $\frac{3}{4}$, entire, hairy, margins usually rolled inwards, stalkless. Fls yellow, in short erect racemes on upper side of branch. Pod $2 \times \frac{1}{2}$, glandular, sticky. Spain. (Fig 3 E)

AMORPHA Ls pinnate; lflets small, entire. Fls purple, with orange stamens; in dense terminal spikes. Pod short, 1-seeded, not splitting

A. canescens Lead Plant. 4 July D Entirely covered with grey down. Stems erect, unbranched. Lflets ov, $\frac{1}{2}$, hairy, stalkless, lowest pair close to main stem. Fls $\frac{1}{4}$. Pod less than $\frac{1}{4}$ U S A.

A. fruticosa False Indigo. 15 July-August D Lflets ov, 2, ending in bristle-like tip, short thread-like stipule at base of each lft, lowest pair some distance from main stem. Pod more than $\frac{1}{4}$, very warty. South United States (Fig. 13 F.)

ANTHYLLIS. Branchlets crooked. Ls. hairy. Fls. yellow.

A. Barba-Jovis. Jupiter's Beard, Silver Bush. 12. May-June. D Stems and ls covered with silky hairs. Ls. pinnate; lflets lanc., 1, entire, white-edged. Fls small, in rounded heads. Mediterranean region. (Fig. 14 E.)

A. Hermanniae (*Cytisus graecus*). 2. June. D. Branchlets end in thin spine. Ls. simple or 3-fol.; lflets linear, obov, 1, entire, blunt-ended, base tapering. Fls $\frac{1}{4}$, in few-flowered axillary clusters. Pod $\frac{1}{2}$, oblong, hairless. South Europe. (Fig. 50 O.)

CYTISUS. Broom. Stems usually long, green and ribbed. Ls. usually 3-fol.; lflets entire. Pod flattened, seed with appendage

(a) *Ls. simple*

C. Beanii. 1 $\frac{1}{2}$. May. D. Prostrate. Ls. linear, $\frac{1}{2}$, hairy. Fls. deep golden yellow. Hybrid raised at Kew.

C. praecox. Warminster Broom. 10. April-May. D. Like *C. albus* (see (b) below), but denser and heavier masses of branches, bending over with their own weight. Ls. silky. Fls. sulphur-yellow, produced in remarkable abundance (Bean). Hybrid. (Fig. 37 O.)

(b) *Ls. 3-fol.*

C. albus. White Spanish Broom. 10. May. D. Stems very slender, in broom-like masses. Lflets linear, $\frac{1}{2}$, silky (ls. simple at top). Fls. $\frac{3}{4}$, white. Pod 1, hairy. Spain and Portugal. (Fig. 37 P.)

CYTISUS—continued

- C Battandieri*. 15 June D Lfts ov, 3, covered with silky hairs. Fls. $\frac{1}{2}$, yellow, fragrant, in upright terminal racemes Pod $2 \times \frac{1}{4}$ North Africa. (Fig 2 H)
- C Dallimorei* 9. May. D Ls. downy Fls. $\frac{1}{2}$, pink to crimson. Hybrid raised at Kew
- C nigricans* 5 June–July. D Stems erect, cylindrical, downy. Lfts obov, 1, pointed. Fls. $\frac{1}{2}$, yellow, slender-stalked, in terminal spikes. Pod $1\frac{1}{2}$ or less, hairy. Europe. (Fig. 3 F)
- C purpurea*. Purple Broom. $1\frac{1}{2}$. May–June. D. Prostrate, with ascending hairless branchlets. Ls. long-stalked; lfts ov, obov., 1. Fls. $\frac{3}{4}$, purple. Pod $1\frac{1}{2}$, hairless. East Europe.
- C scoparius*. Common Broom. 6 May. D. Branches erect, green, angular. Lfts. lanc, $\frac{1}{2}$, slightly hairy. Fls 1, bright yellow Pod 2, hairy on margins. Europe (including Britain) (Fig 37 N)
- Variety *Andreanus* Fls yellow with chocolate wings.
 Variety *fulgens*. Fls. yellow with red wings
 Variety *sulphureus* Fls pale yellow. Smaller and more compact.

ERINACEA PUNGENS Hedgehog Broom. 1. April–May. D. Branches erect, green, stiff, and spiny-pointed. Ls few, simple, linear, $\frac{1}{2}$, entire. Fls $\frac{3}{4}$, purplish blue, in few-flowered clusters just below apex of branchlet. Pod $\frac{3}{4}$, oblong, hairy, splitting. East Pyrenees and North-west Africa. (Fig. 37 A.)

GENISTA. Stems green. Ls usually simple. Fls. yellow, in terminal racemes or clusters. Pod linear-oblong; seed without appendage.

(a) *Ls. opposite, 3-fol.*

- G. horrida*. 1. July. D. Stems rigid, spiny, silver-grey. Fls $\frac{1}{4}$. South France and Spain. (Fig. 37 E.)
- G. radiata*. 3. June D Lfts. $\frac{1}{2}$, linear. Fls. in small heads. Central and South Europe. (Fig. 37 Q)

(b) *Ls. alternate, simple*

- G. aetnensis*. Etna Broom. 20. July. Branches long, dark green, with very few ls. Ls. linear, $\frac{1}{2}$. Fls. scattered singly. Pod $\frac{1}{2}$, ending in sharp curved point. Sicily. (Fig. 37 T.)
- G. anglica*. Needle Furze, Petty Whin. 2. June. D. Spiny. Ls. lanc., ov., $\frac{1}{2}$. Europe (including Britain). (Fig. 37 C.)
- G. anxantica*. Neapolitan Broom. 1. June. D. Ls. ov., 1, hairless. Pod hairless. South Italy.
- G. hispanica*. Spanish Gorse. $1\frac{1}{2}$. May–June. Clusters of branching spines. Ls. few, lanc., $\frac{1}{2}$. Fls. in small heads. South-west Europe. (Fig. 37 D.)
- G. pilosa*. Hairy Greenweed. $1\frac{1}{2}$. June. D. Ls. obov., $\frac{1}{2}$, blunt-ended, hairy, in clusters on older shoots. South-west Europe (including Britain). (Fig. 117 G.)
- G. sagittalis*. 1. May–June. Prostrate. Stems broadly 2-winged, hairy. Ls. few, ov., $\frac{3}{4}$. Europe.
- G. (Carniola) tinctoria*. Dyer's Greenweed. 2. June–July. D. Semi-pros-

GENISTA—continued

trate. Ls linear, lanc, 1, margins fringed with hairs. Fls. $\frac{3}{4}$, in erect racemes Europe (including Britain) (Fig. 117 J)

G. virgata. Madeira Broom 12 June. D. Stems grooved. Ls lanc., $\frac{1}{2}$, grey-green, silky below Fls $\frac{1}{2}$ Madeira (Fig 117 H.)

HALIMODENDRON ARGENTEUM (H. HALODENDRON, CARAGANA ARGENTEA). Salt Tree. 6 June–July D Ls pinnate, with four lfts, silver-grey, common stalk ends in stiff spine, lfts oblanc, $1\frac{1}{2}$, entire, stalkless Fls $\frac{1}{2}$, purple or lilac. Pod 1, inflated Siberia (Fig 13 K)

LABURNUM (CYTISUS LABURNUM) Ls 3-fol., long-stalked; lfts. ov., entire, very shortly stalked Fls usually yellow, in drooping terminal panicles. Pod linear

L. Adamu Purple Laburnum 25. May D Branchlets and ls hairless or nearly so Lfts $2\frac{1}{2}$ Fls purple. Graft hybrid

L. alpinum. Scotch Laburnum 20 June. D Lfts. 4, slightly hairy. Fls. $\frac{3}{4}$, golden yellow, in panicles up to 15 long Pod 3, flattish, keel-winged Europe

Variety *pendulum* Weeping form

L. vulgare Common Laburnum, Golden Chain, Golden Rain. 25. May. D. Lfts 3, downy below Fls $\frac{3}{4}$, golden yellow, in panicles up to 10 long Pod 3, keel not winged. Europe. (Fig. 3 C)

Variety *aureum* Ls yellow

Variety *pendulum*. Weeping form.

Variety *quercifolium*. Lfts. lobed.

LUPINUS ARBOREUS. Tree Lupin 9. May–September. D Ls. digitate, long-stalked; lfts oblanc., $1\frac{1}{2}$, silky below, stalkless. Fls. sulphur-yellow, in erect terminal spikes Pod 3, long and narrow, spirally twisted, hairy, 8–12-seeded. California. (Fig 5 K.)

ONONIS. Shrubby Restharrow. Branchlets crooked. Ls. 3-fol., stipules clasping stalk; lfts. toothed, stalkless. Pod swollen.

O. aragonensis 2 June. D. Young shoots pale grey. Lfts roundish ov., $\frac{1}{2}$, green. Fls. $\frac{1}{2}$, yellow, in pairs on crooked terminal spike. Pod $\frac{1}{2}$, hairy. Pyrenees.

O. fruticosa. 3. May–June D. Lfts. oblanc., 1, wrinkled Fls. $\frac{3}{4}$, pale rose, three on a stalk. Pod 1, bristly. Europe. (Fig. 3 G)

O. spinosa. 1. July–October. D. Spiny. Lfts. oblanc, $\frac{3}{4}$, hairy. Fls. $\frac{1}{2}$, pink, solitary in l-axils Europe (including Britain).

PETTERIA RAMENTACEA (CYTISUS FRAGRANS). Dalmatian Laburnum 8. May–June. D Ls. 3-fol., slender-stalked; lfts. ov., 2, entire, very shortly stalked, blunt-ended, hairless. Fls. $\frac{3}{4}$, yellow, in short, erect, dense racemes. Pod linear-oblong, 2, flat, pointed, dark brown, splitting. East Europe. (Fig. 3 H.)

SPARTIUM JUNCEUM. Yellow Spanish Broom. 12. June–September. Stems erect, rush-like, green, cylindrical, nearly leafless. Ls. linear, 1, bluish green. Fls. 1, yellow, fragrant, in loose terminal racemes. Pod 3, linear, hairy. South Europe. (Fig. 37 M.)

ULEX EUROPAEUS. Gorse, Furze, Whin. 6. January–June. Dense, rigid, very spiny. Branchlets grooved, green, leafless or nearly so. Fls. $\frac{3}{4}$, yellow, solitary. Pod $\frac{1}{2}$, hairy. Europe (including Britain). (Fig. 37 F.)

(II) NINE STAMENS UNITED, ONE FREE

ASTRAGALUS TRAGACANTHA. Goat's Thorn. 1 May-June D Ls pinnate., crowded, common stalk becomes long stiff spine; lfts. ov., $\frac{1}{4}$, entire, silky Fls $\frac{3}{4}$, white or pale purplish red Pod $\frac{1}{2}$, oblong Asia Minor (Fig. 14 H)

CALOPHACA WOLGARICA 3 June-July D Branchlets reddish brown, hairy Ls pinnate; lfts roundish ov., $\frac{1}{2}$, entire, with minute point at tip, downy below. Fls 1, yellow, in hairy racemes Pod cylindrical, 1, hairy. South Russia. (Fig 13 D.)

CARAGANA Ls pinnate, without terminal lft., or digitate, common stalk usually spine-tipped and persistent; lfts entire.

(a) Ls with four lfts.

C. Chamlagii. 3. May-June D Ls. pinnate, lfts obov., $1\frac{1}{2}$, hairless. Fls. 1, reddish yellow, solitary. Pod $1\frac{1}{2}$, slender, hairless China and Japan. (Fig. 13 E)

C. frutescens. 10. May-June D Ls. digitate, lfts obov., 1, notched at apex Fls. 1, bright yellow Pod cylindrical, $1\frac{1}{2}$, hairless South Russia to Japan. (Fig 5 F)

(b) Lfts. more than four

C. arborescens Pea Tree. 20 May-June. D. Common 1-stalk deciduous, grooved, with or without pair of stipular spines at base. Lfts. ov., 1, hairless or nearly so. Fls. $\frac{1}{2}$, yellow, solitary or in few-flowered clusters. Pod 2, slender-stalked. Siberia (Fig. 13 J.)

C. jubata. 2 April-May. D Hairy and very spiny. Common 1-stalk persistent, spine-tipped. Lfts oblong, $\frac{1}{2}$, hairy. Fls. 1, white, solitary. Pod $\frac{3}{4}$, hairy. Siberia.

C. microphylla 10. May-June. D. Common 1-stalk deciduous. Lfts. ov., $\frac{1}{4}$, rounded or notched at apex. Fls. $\frac{3}{4}$, yellow, solitary. Pod 1. Siberia

C. spinosa (C. ferox). 6. June-July. D. Branches long, undivided, spiny. Ls. sometimes digitate; lfts. ov., $\frac{3}{4}$. Fls 1, yellow. Pod $\frac{3}{4}$, hairless. Siberia.

CARMICHAELIA. Lilac Broom Stems erect, green, flattened, leafless except when young. Fls. small, lilac, in axillary racemes. Pod $\frac{1}{2}$, beaked, central part falls out leaving empty frame

* C. australis (Notospartium nanum). 12. July. Young stems $\frac{1}{8}$ wide, hairless. New Zealand. (Fig 37 R.)

C. flagelliformis. 5. July. Stems grooved. New Zealand.

* C. odorata. 10. July. Young stems very slender, wide, $\frac{1}{8}$ downy. New Zealand.

* CHORDOSPARTIUM STEVENSONII. 25. May-July. E. Branchlets green, slender, drooping, leafless or nearly so. Fls. $\frac{1}{4}$, purple, in small clusters or racemes. Pod very small, 1-seeded. New Zealand.

CLIANTHUS. Glory Pea, Parrot's Bill Climbers. 10. June. E. Ls. pinnate; lfts. oblong, 1, entire, blunt-ended, tapering base, downy below, stalkless or

CLIANTHUS—continued

nearly so Fls. 3, in drooping axillary racemes, standard and keel much larger than wings Pod $3 \times \frac{1}{2}$

* *C. Dampieri* Stems hairy Fls red, with black boss. New Zealand

* *C. punceus* Stems hairless or nearly so. Fls red. New Zealand. (Fig. 14 J.)

Variety *albus* Fls white.

COLUTEA Bladder Senna 12 June–July D Branches with fibrous or flaky bark. Ls. pinnate, lfts obov, 1, entire, inversely heart-shaped. Fls. $\frac{3}{4}$, yellow or yellowish red, in racemes Pod 3, inflated, with papery walls

C. arborescens. Fls yellow. Mediterranean region (Fig 14 G.)

C. media Fls brownish red or coppery. Hybrid.

CORONILLA Scorpion Senna, Crown Vetch 8 May–October D. Branchlets green, corrugated Ls pinnate, lfts obov, $\frac{3}{4}$, entire, greyish green, often with prominent red midrib below, hairless or nearly so Fls $\frac{3}{4}$, yellow, sometimes blotched with red, in small long-stalked axillary clusters, each petal with long claw. Pod 2, linear jointed

C. Emerus Lfts green or grey. Europe. (Fig 14 F)

* *C. glauca* Lfts bluish white, glaucous South-east Europe (Fig 13 L.)

DESMODIUM TILIAEFOLIUM 4. September D Ls 3-fol, lfts. broadly ov, 4, entire, stipulate, terminal one long-stalked Fls. $\frac{1}{2}$, red or pink, in large terminal panicles Pod 2, 6-9-jointed. Himalaya. (Fig 3 J)

DORYCNIUM. 2. June–September D Ls. digitate, 5-fol, stalkless; lfts. $\frac{1}{2}$, entire.

D. hirsutum. Stems and ls very hairy. Fls. $\frac{3}{4}$, white, in rounded heads. Pod $\frac{1}{2}$, egg-shaped, 4-seeded Mediterranean region (Fig. 5 C.)

D. suffruticosum. Stems and ls. slightly hairy. Fls $\frac{1}{4}$, pinkish white, in rounded heads Pod $\frac{1}{2}$, round, 1-seeded. South Europe

* ERYTHRINA CRISTA-GALLI. Coral Tree. 8. May–July. D. Stem and l-stalks prickly. Ls 3-fol.; lfts. ov, 4, entire, somewhat glaucous below. Fls. 2, scarlet, standard petal much the largest, in dense terminal racemes. South America. (Fig. 2 G.)

* HARDENBERGIA (KENNEDYA) COMPTONIANA. Climber. E. Ls. alternate, digitate; lfts lanc., 3, entire, rounded or straight base. Fls. $\frac{1}{2}$, blue, white, or pinkish, with yellowish or greenish spot on standard, in axillary racemes. Pod cylindrical, $1\frac{1}{2}$, leathery. Australia (Fig. 5 E.)

HEDYSARUM MULTIJUGUM. French Honeysuckle. 3. June–July. D. Young branchlets erect, zigzag. Ls. pinnate; lfts. ov., $\frac{1}{2}$, entire, numerous, hairy, lowest pair close to main stem Fls. $\frac{3}{4}$, rosy purple, in long upright racemes. Pod flat, separating into circular 1-seeded segments. Mongolia. (Fig. 14 M.)

INDIGOFERA GERARDIANA. 8. July–September. D. Branches downy, slightly ribbed. Ls. pinnate, stalk grooved; lfts. ov., $\frac{1}{2}$, hairy, apex with short bristle. Fls. $\frac{1}{2}$, rosy purple, in axillary racemes. Pod linear, $1\frac{1}{2}$, cylindrical. Himalaya. (Fig. 14 A.)

LESPEDEZA SIEBOLDII (L. BICOLOR). Bush Clover. 8. September. D. Ls. 3-fol.; lfts. elliptical, lanc., $2\frac{1}{2}$, entire, without stipules, apex rounded (with minute tip), terminal lfts., long-stalked. Fls. $\frac{1}{2}$, rosy purple, in axillary racemes. Pod not

jointed, or 1-jointed. China and Japan. (Fig. 3 L.) (CAMPYLOTROPIS is similar except that the fl.-stalks are jointed)

MEDICAGO ARBOREA. Moon Trefoil. 8 April–September D Stems very leafy, little branched, covered with grey down Ls. 3-fol., stalk hairy; lfts. wedge-shaped, $\frac{3}{4}$, toothed or entire, middle one stalked, silky below Fls. $\frac{1}{2}$, yellow, crowded at end of shoot in axillary racemes Pod $\frac{1}{2}$, curled. South Europe. (Fig. 3 K)

NOTOSPARTIUM CARMICHAELIAE. Pink Broom 10. July D Branches arching, slender, rush-like, slightly flattened, grooved. Ls. few or absent, simple, roundish ov., $\frac{1}{4}$, only seen on young plants Fls. $\frac{1}{4}$, purplish pink, in downy axillary racemes. Pod $\frac{3}{4}$, slender, 3-8-jointed New Zealand. (Fig. 37 S)

* PSORALEA GLANDULOSA 6 July–August. E. Ls. alternate, 3-fol., lfts. ov., lanc., gland-dotted, stalked. Fls. $\frac{1}{2}$, blue and white, in long axillary racemes. South America. (Fig. 2 K)

* PUERARIA THUNBERGIANA. Kudzu Vine. Tall climber July–August. Ls. 3-fol., long-stalked; lfts. ov., 6, entire or lobed, terminal one the largest, hairy on margins, stipulate. Fls. $\frac{3}{4}$, violet, in dense erect terminal racemes up to 9 long. Pod $3 \times \frac{1}{2}$, hairy. (Root is fleshy and tuberous) China and Japan.

ROBINIA. Buds small, hidden by base of l.-stalk, no terminal bud. Branchlets usually with stipular spines in pairs. Ls. pinnate, lfts. ov., entire Fls. in drooping racemes. Pod oblong or linear, splitting into two.

R. hispida. Rose Acacia. 12. June. D. Branchlets bristly, usually without spines. Lfts. 2, with minute point at end, hairless or nearly so. Fls. 1, deep rose. Pod 3, bristly. South United States.

R. Kelsey. 12. June D. Branchlets hairless, with slender prickles Lfts. lanc., $1\frac{1}{2}$, pointed, hairless Fls. 1, bright rose Pod 2, reddish, bristly. East United States. (Fig. 14 B)

R. Pseudacacia. Locust Tree, False Acacia. 80. June. D. Bark with deep interlacing corrugations. Branchlets tortuous. Lfts. 2, rounded or notched at apex; downy at first, then smooth. Fls. $\frac{3}{4}$, white. Pod 3, not bristly. East United States. (Fig. 13 G.)

Variety *aurea*. Ls. yellow.

Variety *Decaisneana*. Fls. pink

Variety *fastigiata*. Branches all upright (like Lombardy poplar).

Variety *inermis*. Small mop-headed tree, without spines

WISTARIA. Woody climbers 25. May–June. D. Ls. pinnate; lfts. ov., lanc., 3, entire, pointed, on short foot-stalk, margins often wavy. Fls. $\frac{3}{4}$, lilac or white, in long vertically hanging racemes. Pod 6, elongated, flattened, with persistent style.

W. floribunda Ls. 13-19-fol. Racemes lilac, up to 10 long. Japan.

Variety *alba*. Fls. white

Variety *macrobotrys* (*multijuga*). Racemes up to 36 long.

W. sinensis. Ls. 9-13-fol. Racemes lilac, up to 12 long. China. (Fig. 13 A.)

Variety *alba*. Fls. white.

W. venusta. Lfts. downy. Racemes white, up to 6 long. China and Japan.

(III) STAMENS ALL FREE

* *ANAGYRIS FOETIDA*. 12. May-June D Ls 3-fol, lfts ov., lanc., $2\frac{1}{2}$, entire, greyish green, downy below Fls. 1, yellow, in short racemes on previous year's wood. Pod $5 \times \frac{3}{4}$, curved, pointed at both ends Mediterranean region. (Fig. 1 L.)

* *CALPURNIA AUREA* 20 D Branches slender, downy. Ls alternate, pinnate, stalk channelled, lfts. ov., 2, rounded or notched at end. Fls. 1, yellow, in axillary racemes. Pod $2 \times \frac{1}{2}$, thin, 5-6-seeded South Africa.

CLADRASTIS Yellow Wood Buds completely enclosed in swollen base of 1-stalk Ls pinnate, lfts. alternate, ov., 4, entire, pointed, terminal one the largest Fls. white or pinkish, in terminal panicles. Pod flattened, narrow oblong, 3-6-seeded.

C platycarpa (*Platysprion platycarpum*) 60. July D Ls 7-15-fol.; lfts. narrow ov., lanc, 4, with stipules. Fls $\frac{1}{2}$, white, with yellow spot at base of standard, in erect panicles Pod 3, winged. Japan.

C sinensis 70 July D Ls. 9-13-fol, lfts lanc, 5, downy. Fls $\frac{1}{2}$, pinkish white, panicles erect Pod 3, hairless West China.

C tinctoria (*C lutea*, *Virgilia lutea*). 40. July. D Ls. 7-9-fol.; lfts. broadly ov., 5, hairless Fls 1, white, fragrant, in drooping panicles. Pod 4. East United States. (Fig. 13 B)

C Wilsoni. 50. July D Ls. 9-15-fol., lfts narrow ov., 3, downy. Fls. 1, white, fragrant, in lax panicles Pod 2, downy. West China.

MAACKIA AMURENSIS (*CLADRASTIS AMURENSIS*). 40 July. D Bark peeling. Ls. pinnate; lfts. opposite, ov., 3, blunt-ended, hairless. Fls. $\frac{1}{2}$, white, in dense erect racemes. Pod $3 \times \frac{1}{2}$, flat, seam slightly winged North China (Fig. 13 c.)

PIPTANTHUS NEPALENSIS. Evergreen Laburnum. 10. May-July E. Ls. 3-fol., long-stalked; lfts. lanc., 4, entire, pointed, glaucous below, stalkless. Fls. 1, yellow, in stiff, erect, terminal racemes. Pod $5 \times \frac{3}{4}$. Himalaya (Fig. 3 B)

* *PODALYRIA SERICEA*. 3. November-February E. Ls. alternate, ov. or obov., 2, tapering base, covered on both sides with silky silvery hairs. Fls. rosy purple, solitary in 1-axils. South Africa. (Fig. 115 K.)

SOPHORA. Branchlets jointed. Ls. pinnate. Fls. in racemes or panicles. Pod cylindrical, constricted between seeds (like a string of beads), style persistent.

S. japonica. Pagoda Tree. 80. September. D. Lfts. ov., lanc., 2, pointed, rounded base, dark green and glossy above, grey below. Fls. $\frac{1}{2}$, creamy white, in terminal panicles. Pod 3, hairless. China. (Fig. 14 c.)

* *S. tetraptera*. 40. May. E. Young branchlets zigzagged, covered with tawny down. Lfts. ov., $\frac{1}{2}$, entire, often very numerous. Fls. 1, yellow. Pod 8, 4-winged. New Zealand.

Variety *grandiflora* (*Edwardsia grandiflora*). Fls. $1\frac{1}{2}$. (Fig. 10 c.)

Variety *microphylla* (*Edwardsia microphylla*). Lfts. smaller and more numerous.

S. vicifolia. 8. June. D. Branches spiny, downy. Lfts. ov., $\frac{1}{2}$, entire, silky on both sides, common 1-stalk channelled Fls. $\frac{3}{4}$, blue and white. Pod $2\frac{1}{2}$, 1-4-seeded, long-beaked. China. (Fig. 14 D.)

† Sub-family *CAESALPINIACEAE* K₅ or (5), C₅, A₁₀, G₁

Fls not or only slightly resembling those of sweet pea.

* *BAUHINIA DENSIFLORA*. 10 June. D. Ls simple, ov, $2\frac{1}{2}$, divided to one-third depth into kidney-shaped halves, downy below. Fls. $\frac{1}{2}$, white, in short downy racemes. West China. (Fig 27 A.)

CAESALPINIA JAPONICA. 8. June-July. D. Branches rambling, prickly Ls. 2-pinnate; lfts ov., $\frac{3}{4}$, entire, downy below. Fls $1\frac{1}{2}$, yellow, in large terminal racemes, petals spreading, nearly equal; stamens red. Pod 3×1 , ov, lanc, flat, 6-9-seeded. Japan. (Fig 20 F)

CASSIA Ls. pinnate, without terminal lft.; lfts lanc., entire Fls. $\frac{1}{2}$, yellow, in terminal or axillary racemes, petals spreading. Pod 4

* *C. corymbosa* (*C. floribunda*) 10. Ls. 6-fol. Fls. in branched clusters. South America.

C. marylandica. Wild Senna. 3 June-September D Ls. 10-20-fol.; lfts. $2\frac{1}{2}$, ending in bristle Petals yellow, stamens purple. Pod linear, flat. U.S.A. (Fig. 13 H)

CERCIS. Ls alternate, simple, broadly ov. or circular, 4, heart-shaped base, chief veins palmate, hairless Fls $\frac{3}{4}$, pink or purplish, in clusters on old wood, appearing before leaves Pod $5 \times \frac{1}{2}$, flat, red.

C. canadensis. Redbud. 30 May. D. Ls. with short point at apex Fls. rosy pink. North America.

C. Siliquastrum. Judas Tree. 20. May D. Ls. rounded or notched at apex. Fls. purplish red. Mediterranean region (Fig. 117 K)

GLEDITSCHIA. Locust. Stems and branches usually armed with stout and often branched spines Ls. pinnate or 2-pinnate. Fls. small, green, in racemes, petals spreading. Pod large, flattened.

G. aquatica. Water Locust. 60. June. D. Trunk with branched spines Lfts. ov., 1, toothed. Pod 2, thin, diamond-shaped, 1-2-seeded. South United States. (Fig 19 c.)

G. caspica. Caspian Locust. 40 July. D. Very spiny. Lfts. ov., 2, toothed. Pod 8, curved. North Persia.

G. japonica (*G. horrida*). Japanese Locust. 70. June-July. D. Spines slightly flattened, up to 4 long, often branched. Lfts. ov., $1\frac{1}{2}$, entire or sparsely toothed. Pod 12, curved, twisted, seeds near middle. Japan.

G. triacanthos. Honey Locust. 140. July. D. Trunk with bunches of large spines. Lfts. ov., lanc., $1\frac{1}{2}$, toothed. Pod 18, sickle-shaped. East United States. (Fig. 19 B.)

Variety *inermis*. Without spines or nearly so; more slender growth.

GYMNOCLADUS CANADENSIS (*G. DIOICA*). Kentucky Coffee Tree. 100. July. D. Ls. 2-pinnate; lfts. ov., 3, entire, lowest pairs not divided; common stalk left on branches after fall of ls. Fls. $\frac{1}{2}$, greenish white, in terminal panicles, unisexual. Pod oblong, 9, thick, brown; seeds large, circular. North America. (Fig. 19 E.)

Sub-family *MIMOSEAE*. K₄-5, C₄-5, A (4-∞), G₁

Ls 2-pinnate or replaced by leaf-like branches

* *ALBIZZIA JULIBRISSIN* Pink Siris 40. July-August D Ls 2-pinnate; lfts. oblong, $\frac{1}{2}$, midrib on one side. Fls small, in round heads or axillary spikes, conspicuous by means of numerous pink stamens, K₅, C₅. Pod strap-shaped, 6. Orient. (Fig 18 D.)

ACACIA Ls alternate, 2-pinnate, usually with minute lfts.; often absent and replaced by flattened leaf-like branches Fls. small, yellow, in ball-like or brush-like clusters

* *A armata* Kangaroo Thorn. 10 April-May E Young branchlets bristly. Ls absent False ls, linear or oblong, 1, point curved, closely set on twigs. Fls in round heads Pod $2 \times \frac{1}{4}$, silky. Australia. (Fig. 116 D)

* *A Baileyana* Bailey's Mimosa. 30 March-April E Branchlets hairless. Ls 2-pinnate, arranged more or less radially round the stem; lfts. minute, linear, bluish grey Fls in round heads in axillary racemes on old wood Australia (Fig. 20 D.)

* *A dealbata*. Mimosa, Silver Wattle. 100 March-April and July-September. E Young branchlets downy. Ls 2-pinnate; lfts. minute, linear. Fls. fragrant, in round heads in axillary panicles Pod $3 \times \frac{1}{2}$, blue-white, flat. Australia. (Fig. 20 C.)

* *A juniperina*. 30. August-September E. Ls. absent False ls. linear, awl-shaped, $\frac{1}{2}$, prickly pointed, alternate. Fls in round heads. Australia (Fig. 52 P.)

* *A longifolia*. Golden Wattle. 30 April-May E. Young branchlets hairless. Ls. absent. False ls. oblong, lanc., 6, tapered at base, dark green. Fls. in slender cylindrical spikes. Pod $4 \times \frac{1}{4}$. Australia.

* *A. melanoxylon* Blackwood 80. April-May. E Young branchlets downy. Ls. present in young trees, 2-pinnate.; lfts $\frac{1}{2}$ False ls. lanc., curved, tapered at both ends, 3-5-nerved. Fls in round heads. Pod $4 \times \frac{1}{2}$, flat, curved. Australia.

* *A. rhetinoides*. 25. August-September. E. Ls. absent. False ls. linear, lanc, 3, 1-nerved. Fls. in round heads in short racemes. Pod $4 \times \frac{1}{2}$, straight Australia. (Fig 52 G.)

* *A. verticillata*. Prickly Mimosa. 30 April-May. E. Young branchlets downy. Ls absent. False ls linear, awl-shaped, $\frac{1}{2}$, prickly pointed, in whorls Fls. in spikes like bottle brushes, 1 long. Pod 2, slender, curved. Australia. (Fig. 52 D.)

. Family 43. *ROSACEAE*. K₄-5, C₄-5 or 0, A₅-∞, G₁-∞ or (1-∞)

The axis of the flower is often enlarged into a flattish or hollow structure on the rim of which the stamens are borne. Ls. usually stipulate.

(I) OVARY SUPERIOR; fruit dry, usually splitting
(SPIRAEA SECTION)

EUCRYPHIA. Brush Bush. Ls. opposite. Fls. 2, white, solitary or in pairs, K₄-5, C₄-5, A∞, G (5-12). Fruit a woody pear-shaped capsule.

* *E. cordifolia*. 20. July-August. E. Ls. ov., 3, heart-shaped base, dul

EUCRYPHIA—continued

green, toothed, margins wavy, downy below. Fls 5-petalled. Chile.
(Fig 59 E)

E pinnatifolia (*E glutinosa*). 25 July–August. E Ls pinnate; lflets. ov, $1\frac{1}{2}$, evenly toothed, dark glossy green, stalkless. Fls 4-petalled. Chile.
(Fig. 9 B)

EXOCHORDA. Ls alternate or in clusters, ov, 3, entire or toothed near apex, thin, without stipules Fls $1\frac{1}{2}$, white, 5-petalled, petals narrowed at base into a claw. Fruit $\frac{1}{2}$, bony, 5-angled

E Albertu (*E Korolkowu*) 15 May–June. D. Branches erect; branchlets hairless. Ls obov, narrowly wedge-shaped base, toothed at apex, hairless. Stamens in five groups of five each Turkestan (Fig 89 H)

E. Giraldn. 20. May–June D. Ls. ov, entire, broadly wedge-shaped base, stalk pink Petals gradually narrowed. China.

E. grandiflora (*E. racemosa*) Pearl Bush 10. May–June D. Ls ov., lanc, entire or toothed towards apex, stamens in three groups of five each. China (Fig 119 A)

E. macrantha. 10 April–May. D. Hybrid with more abundant fls.

* LYONOTHAMNUS FLORIBUNDUS 50. E. Ls opposite, lanc, 6, entire. Fls $\frac{1}{2}$, white, in terminal branched clusters, K5, C5, A15 Fruit woody. Islands off California.

Variety *asplenifolius* Ls. pinnate; lflets 4, deeply lobed, dark green and smooth above, paler and downy below.

NEILLIA. Nine Bark. Branches slender, arching or spreading Ls. alternate, ov, 3-nerved at base, double-toothed, often lobed Fls. $\frac{1}{2}$, white or pinkish, tubular, in terminal panicles, K5, C5, A20–40. Fruit of four or five shining pointed pods.

N. capitata (*Physocarpus capitatus*). 10 June. D. Ls broadly ov, 4, 3-lobed, downy below. California.

N. opulifolia (*Physocarpus opulifolius*) 10. May. D. Ls. ov., 3, sometimes 3-lobed. Fls. white tinged with pink, in hemispherical panicles. North America. (Fig. 28 A)

SPIRAEA. Ls. alternate, usually toothed and with veins extending to margin, without stipules. Fls. small, white, pink, or red, in many-flowered clusters or panicles, K5, C5, A ∞ , G5. Fruit a dry splitting capsule.

(a) *Ls. simple*

S. arguta. 8. April D. Stems slender, downy and leafy. Ls. oblanc., obov., 1, entire or with a few teeth near apex, veins prominent below. Fls. white, in small clusters forming long arching sprays of bloom. Hybrid. (Fig. 95 A)

S. bella. 3. June. D. Branches slender, spreading, angled. Ls. ov., 2, sharply toothed from beyond middle, somewhat glaucous below, nearly hairless. Fls. pink, unisexual, in small branched clusters. Himalaya. (Fig. 95 M.)

S. canescens (*S. flagelliformis*). 15. June. D. Stems erect, but arching or drooping at top, ribbed. Ls. ov., 1, rounded and toothed at apex, grey

SPIRAEA—continued

- down below. Fls white or cream, in branched clusters forming long arching sprays of bloom. Himalaya. (Fig. 95 B.)
- S. crenata* 5. May D. Ls ov, 1, toothed at apex or entire, 3-nerved. Fls white, in small rounded clusters. South-east Europe (Fig. 95 C.)
- S. discolor* (*S. araeifolia*, *Holodiscus discolor*) 12 June–July D. Stems erect, but arching or drooping at top, ribbed Ls ov., 3, lobed, lobes toothed, grey-felted below Fls. creamy white, in large drooping panicles. Fruit non-splitting North-west America (Fig. 36 H)
- S. Douglasii* 6. July–August D Stems reddish-felted when young Ls. lanc, 4, coarsely toothed towards end, dark green above, grey-felted below. Fls purplish rose, in large erect terminal panicles; stamens pink. North-west America (Fig. 95 D)
- S. japonica* 5. July–August D Stems erect, shining brown. Ls. lanc., 4, coarsely toothed, dark green above, glaucous below. Fls red in large flat terminal panicles. China and Japan (Fig. 95 J.)
- Variety *Bumalda* Dwarf
- Variety *Bumalda* *Anthony Waterer* Fls brilliant carmine.
- S. (Spiraea) laevigata*. 6. May D Branches stout, erect, reddish brown. Ls. ov, 3, entire, tapering base, bluish green, hairless. Fls. white, in terminal panicles. Siberia
- S. media* (*S. confusa*) 6 April–May D Stems cylindrical, hairless. Ls. ov, toothed near apex or entire Fls. white, in erect racemes. Europe. (Fig. 95 L.)
- S. Menziesii* 5. July–August D. Stems erect, brown, suckering freely; buds hairy. Ls. ov., lanc., 3, toothed in outer half, grey-green and downy below. Fls rose-coloured, in large erect panicles. West North America. (Fig. 95 E.)
- Variety *triumphans*. Ls toothed nearly to base.
- S. prunifolia*, variety *flore pleno* 6 April–May. D. Stems arching. Ls. ov., $1\frac{1}{2}$, finely and evenly toothed, downy below. Fls double, white, in small clusters produced in profusion. China and Japan. (Fig. 95 K.)
- S. salicifolia*. Bridewort 6 June–July. D. Stems erect, hairless, suckering freely. Ls. lanc, 3, sharply toothed, green on both sides. Fls. pinkish white, crowded in erect terminal panicles. Europe (including Britain) to Japan (Fig. 95 H.)
- S. Thunbergii* 5. March–April. D. Stems slender, angled, downy. Ls. linear, lanc, 1, teeth incurved, green on both sides. Fls. white, in small clusters on leafless twigs. China and Japan. (Fig. 52 K.)
- S. tomentosa*. Steeplebush, Hardhack. 5. August–September. D. Stems erect, suckering freely, brown-felted when young. Ls. ov., 3, coarsely toothed almost to base, dark green above, tawny-felted below. Fls. red, in erect branching panicles. U S.A. (Fig. 95 F)
- S. Van Houttei*. 6. May–June. D. Stems arching, hairless, brown. Ls. obov., 1, often lobed, coarsely toothed in outer half, dark green above, glaucous below. Fls. white, in small clusters in great profusion. Hybrid. (Fig. 95 N.) (*S. cantoniensis* similar, but ls. narrower and longer.) China.
- S. Veitchii*. 12. June–July. D. Stems arching, reddish brown. Ls. usually in two opposite rows, ov., lanc., $1\frac{1}{2}$, entire, blunt-ended (with minute

SPIRAEA—continued

point), somewhat glaucous below. Fls. white, in branched clusters. China (Fig. 95 G.)

S. Wilsoni 6. June–July. D. Like *S. Veitchii*, but upper side of ls downy. China.

(b) *Ls pinnate*; *lfts. lanc*, 4, *long-pointed, stalkless*.

Fls. ivory-white, in large branching terminal panicles

S. Aitchisonii (*Sorbaria angustifolia*) 10 July–August D Young stems red. Lfts. evenly toothed, green and hairless on both sides. Afghanistan.

S. arborea (*Sorbaria arborea*) 20 July–August. D Lfts oblong, lanc, double-toothed, star-shaped hairs below. West China. (Fig. 12 K)

S. Lindleyana (*Sorbaria Lindleyana*) 20. July–August D. Lfts double-toothed, simple hairs below Himalaya. (Fig. 12 J)

S. sorbifolia (*Sorbaria sorbifolia*). 6. July–August. D. Stems erect, suckering freely. Lfts. double-toothed Fl. panicles stiff, erect. Himalaya to Japan.

STEPHANANDRA. Ls alternate, 3-lobed, sharply toothed, long-pointed, veins in grooves. Fls small, greenish or yellowish white, in terminal panicles up to 4 long, K₅, C₅, A_{10–20}, G₁. Fruit of one to two dry pods

S. incisa (*S. flexuosa*) 8. June. D Ls deeply lobed. Fls with ten stamens. China and Japan.

S. Tanakae (*Neillia Tanakae*). 6. June. D. Ls. slightly lobed. Fls. with fifteen to twenty stamens Japan (Fig. 28 B.)

(II) OVARY SUPERIOR (apparently inferior in Roses);

Fruit fleshy or berry-like, with more than one seed;
or, if dry, does not split

(ROSE SECTION)

CERCOCARPUS Mountain Mahogany. Ls alternate, often in clusters. Fls. small, without petals, in axillary clusters; ovary 1-celled, enclosed in calyx tube. Fruit 1-seeded, with long feathery appendage.

C. intricatus. 6. June. E Stiff and intricately branched. Ls. linear or narrow lanc., 1, entire, margins recurved, grey-felted below. West North America. (Fig. 52 C.)

C. ledifolius. 30. June E. Ls. lanc., 1, entire, glossy above, downy below, margins recurved. West North America. (Fig. 117 M.)

* *C. parvifolius*. 15. June. E. Ls. ov, 1½, toothed in outer half, four to six pairs prominent parallel veins. California. (Fig. 87 K.)

CHAMAEBATIA FOLIOLOSA. Tarweed. 3. July. ½ E. Ls. alternate, ov., 2½, 3-pinnately dissected, hairy. Fls. 1, white, in terminal branched clusters, C₅. California. (Fig. 19 D.)

* COWANIA MEXICANA. 6. July–September. E. Ls. alternate or in clusters, ov., ½, 3-5-lobed, dark green above, white-felted below, margins recurved. Fls. ¾, yellow or white, at end of short branchlets, K₅, C₅, A ∞, G_{1–12}. Fruit with silky tails. South-west United States. (Fig. 34 C.)

DRYAS OCTOPETALA. Mountain Avens. $\frac{1}{4}$ July–August. E Prostrate rock plant Ls. alternate, ov, 1, heart-shaped base, blunt-ended, with a few large teeth or lobes, white below, slender-stalked. Fls 1, white, solitary on erect very slender stalk, K8, C8 Fruit of numerous seed vessels, each with long silky tail. North Europe (including Britain), North America. (Fig. 87 J.)

FALLUGIA PARADOXA 5 Summer D. Branchlets slender, greyish white. Ls. wedge-shaped, $\frac{3}{4}$, cut into narrow oblong lobes running into l.-stalk, downy all over, margins recurved. Fls. $1\frac{1}{2}$, white, solitary or in few-flowered racemes, K5, C5, A ∞ , G ∞ Fruit with feathery tails California. (Fig. 34 B.)

KERRIA JAPONICA (CORCHORUS JAPONICUS) Jew's Mallow 6. April–May. D. Branchlets slender, zigzagged, with l. at each angle Ls alternate, ov, 4, long-pointed, sharply double-toothed, heart-shaped base, hairless above, hairy below. Fls. $1\frac{1}{2}$, yellow, solitary, slender-stalked, K5, C5, A ∞ , G5–8 Fruit of 5–8 dry, brownish-black seed vessels China. (Fig. 89 G.)

Variety *variegata* Ls. with white edge.

Variety *flore pleno* Fls double (Fig. 89 G.)

MARGYRICARPUS SETOSUS. Pearl Fruit. 1. Summer. E Prostrate Branches yellow, partly covered by sheathing bases of l.-stalks Ls. alternate, pinnate; lfts. linear, $\frac{1}{4}$ or more, green, margins recurved Fls small, solitary, inconspicuous, no petals. Fruit a small white berry Chile. (Fig. 49 D) (*M. alatus* is very similar, but with winged fruits) (Fig. 49 E)

NEVIUSA ALABAMENSIS Snow-in-Summer. 6 June–July D Ls alternate, ov., 3, pointed, double-toothed, hairless or nearly so Fls 1, without petals; sepals with toothed lobes, stamens white, numerous, and conspicuous. Alabama. (Fig. 93 E)

POTENTILLA FRUTICOSA. Shrubby Cinquefoil. 4 May–September. D Bark shreddy. Ls. pinnate, 5-fol; lfts. lanc, 1, pointed, entire. Fls 1, yellow, solitary, 5-petalled, short-stalked. Northern Hemisphere. (Fig. 14 K)

PURSHIA TRIDENTATA. 10. May. D. Ls. alternate or in clusters, obov., 1, 3-lobed at apex, whitish and hairy below, tapering base Fls. $\frac{1}{2}$, yellowish, K5, C5, A25, G1 or 2, solitary. Fruit $\frac{1}{4}$, spindle-shaped, projecting beyond persistent calyx. West North America. (Fig. 29 E)

RHODOTYPOS KERRIOIDES. White Kerria 6. June–July. D Branches erect, hairless. Ls opposite, ov., 4, long-pointed, deeply and unevenly toothed, prominently parallel-veined, dark green above, hairy below. Fls. 2, white, solitary, K4, C4, A ∞ , G4. Fruit of four hard black berries. China and Japan. (Fig. 61 F.)

ROSA. Rose. Stems usually with thorns or prickles. Ls. alternate, pinnate; stipules expanded into two pointed wings. K5, C5, A ∞ , G1– ∞ . Ovaries enclosed in fleshy urn-shaped receptacle which becomes the fruit.

(a) *Styles project conspicuously beyond mouth of receptacle*

R. arvensis. Trailing Wild Rose. June. Stems long and very slender. Lfts. ov., 2, simply toothed, glaucous below. Fls. $1\frac{1}{2}$, white, often solitary, styles united into a column almost as long as stamens. Fruit egg-shaped, dark red. Europe (including Britain). (Fig. 16 B.)

ROSA—continued

R. foetida (*R. lutea*) See under (*b*).

R. indica Chinese or Monthly Rose. June–November. Stems green, with short flattened hooked prickles. Lfts. ov, 3, glossy green above, glaucous below, hairless. Fls. 2, pink, semi-double, in clusters; styles free. Fruit $\frac{3}{4}$, pear-shaped, scarlet. China. (Fig. 15 A)

Variety *fragrans* Tea-scented (source of Tea Roses, Gloire de Dijon, Maréchal Niel, etc.)

R. Noisettiana Noisette Rose June Branches arching, prickles reddish. Lfts. oblong, lanc, 2, glossy, hairless. Fls. 2, white, pink, or red, styles free; in large terminal panicles. Hybrid.

(Source of William Allen Richardson.)

R. moschata. Musk Rose June–July. Lfts. ov., lanc., 3, simply and evenly toothed. Fls. $1\frac{1}{2}$, pale yellow to white, in large branched clusters, styles united into a column almost as long as stamens. Fruit $\frac{1}{2}$, pear-shaped, red. South Europe to India. (Fig. 16 A)

R. multiflora (*R. polyantha*) June–July. Very vigorous. Stems hairless, with small recurved prickles. Stipules deeply and pinnately dissected. Lfts. ov, $1\frac{1}{2}$, downy. Fls. 1, white, pink, or red, in branching panicles, styles united into a column almost as long as stamens. Fruit $\frac{1}{2}$, egg-shaped, red, calyx deciduous. China and Japan. (Fig. 15 G)

• (Source of American Pillar, Crimson Rambler, etc.)

R. setigera Prairie Rose June–August. Ls. mostly 3-fol, lfts. ov, 3. Fls. 2, pink fading to white, in few-flowered clusters. Fruit $\frac{1}{2}$, round. North America.

R. Wichuriana. July–August. Barren stems unbranched. Lfts. ov., 1, coarsely toothed, glossy green on both sides. Fls. 2, white, in panicles, styles united into a column almost as long as stamens. Fruit $\frac{1}{2}$, round, calyx deciduous. Japan.

Variety *rubra*. Fls. red.

(Source of Alberic Barbier, Dorothy Perkins, Lady Gay, etc.)

(*b*) *Styles project slightly or not at all beyond mouth of receptacle*

(1) FRUIT WITH HAIRS OR BRISTLES

R. bracteata. Macartney Rose July–August. Stems thick, downy and bristly, with pairs of hooked prickles. Lfts. obov, 2, rounded at end, glossy dark green above. Stipules joined to l.-stalk near base only. Fls. 3, white, surrounded by several downy and deeply dissected bracts. Fruit $1\frac{1}{2}$, round, orange-red, woolly. China. (Fig. 15 E.)

R. centifolia. Cabbage Rose June–July. Stems very prickly. Lfts. ov., $2\frac{1}{2}$, usually five in number, heart-shaped base, firm, downy below, common stalk not prickly. Fls. pink or red, fragrant, very double, nodding, in clusters, stalks with numerous gland-tipped hairs or bristles. Fruit round or egg-shaped. Origin unknown.

Variety *muscosa*. Moss Rose. (Fig. 16 D.)

Variety *parvifolia*. Burgundian Rose Lfts. $1\frac{1}{2}$. Fls. 1.

Variety *pomponia*. Pompon Rose. Dwarf. Lfts. 1. Fls. $1\frac{1}{2}$, red.

ROSA—continued

- R. damascena* Damask Rose 6 June–July. Ls. usually 5-fol.; lfts. ov., 2, evenly toothed, pale green and downy below. Fls. pinkish to red, double, in large clusters, very fragrant. Fruit 1, pear-shaped, red, bristly. East Europe.
 Variety *trigintipetala* Fls. semi-double, red. Used for 'attar' in the East
 Variety *variegata* York and Lancaster Rose. Petals striped.
- R. Davidi*. June–July. Prickles few and straight. Lfts. ov., $1\frac{1}{2}$, evenly toothed, slightly glaucous and downy below. Fls. 2, pink, in branched clusters, styles slightly projecting. Fruit $\frac{3}{4}$, scarlet. China
- R. gallica* French Rose. June–July. A bush 3-4 ft high, with creeping roots and erect stems (Bean). Lfts. ov., 2, rounded or heart-shaped base, glandular on margins. Fls. 2, dark red, solitary or in twos or threes, stiff-stalked, sepals pinnately lobed. Fruit $\frac{1}{2}$, round or pear-shaped, dark dull red, calyx deciduous. South Europe (Source of Hybrid Perpetual Roses.)
- R. involuta* Sabine's Rose. June. Prickles straight, unequal. Lfts. ov., 1, downy below. Fls. pink, solitary, on short bristly stalk. Fruit round, red. Europe (including Britain). (Fig. 16 J)
- R. laevigata* Cherokee Rose. May–July. Tall climber. Ls. mostly 3-fol.; lfts. ov., 2, glossy above, net-veined below. Fls. 3, white, fragrant, solitary. Fruit $1\frac{1}{2}$, pear-shaped, bristly. China.
- R. micrantha*. Small-flowered Briar. June. Prickles equal, hooked. Lfts. broadly ov., 1, double-toothed, with glandular hairs below. Fls. 1, pink or white. Fruit egg-shaped. Europe (including Britain). (Fig. 16 G.)
- R. Moyesii*. June–July. Stems erect. Lfts. ov., roundish, $1\frac{1}{2}$. Fls. 2, dark red, solitary or in pairs. Fruit $1\frac{1}{2}$, bottle-shaped, orange-red, with scattered glandular hairs, calyx persistent. China. (Fig. 15 D.)
- R. rubiginosa* (*R. Eglanteria*). Sweet Briar, Eglantine. Lfts. ov., 1, double-toothed, fragrant. Fls. $1\frac{1}{2}$, pale pink, solitary or in small clusters. Fruit $\frac{3}{4}$, egg-shaped, orange-scarlet. Europe (including Britain). (Fig. 15 F.) (Source of Penzance Briars.)
- R. sericea*. May–June. Large spreading bush; branches arching and very leafy. Pair of curved bristles at base of l.-stalk. Lfts. obov., $\frac{3}{4}$, rounded at end, toothed in outer half, silky hairs below. Fls. $1\frac{1}{2}$, creamy white, petals four. Fruit $\frac{1}{2}$, red, pear-shaped, calyx persistent. India and China. (Fig. 16 K.)
- R. sertata*. June. Prickles straight, slender. Branchlets glaucous. Lfts. ov., $\frac{3}{4}$, hairless, slightly glaucous below. Fls. 2, rosy purple, solitary or in twos or threes, sepals entire. Fruit $\frac{3}{4}$, egg-shaped, deep red. China.
- **R. setipoda*. June. Prickles straight, broad. Lfts. ov., 2, dark green above, glaucous below. Fls. 2, pinkish purple, in branched clusters, stalk and receptacle covered with gland-tipped bristles, sepals long and narrow with toothed l-like tips. Fruit 1, deep red, nodding. China.
- R. villosa*. Downy Rose. June–July. Dense shrub. Lfts. ov., 2, greyish green, hairy, double-toothed. Fls. $1\frac{1}{2}$, pink, solitary or in 2-3-flowered clusters, stalks bristly. Fruit 1, bristly. Europe (including Britain). (Fig. 16 C.)
- R. virginiana* (*R. lucida*). June–July. Dense mass of erect stems up to 3 feet.

ROSA—continued

Lfts. ov, 2, glossy, hairless. Fls 2, pink, solitary or in small clusters; sepals 1, long-pointed. Fruit $\frac{1}{2}$, red, orange-shaped. East United States. (*R. carolina* is very similar, but in flower up to September, and ls. usually 5-fol.)

Variety *alba*. Fls. white.

(11) FRUIT PERFECTLY SMOOTH

R. canna Dog Rose. June–July. Prickles of about equal size. Lfts. ov, $1\frac{1}{2}$, evenly toothed, hairless. Fls $1\frac{1}{2}$, white or pinkish, in clusters, fragrant, sepals pinnately lobed. Fruit $\frac{3}{4}$, red, egg-shaped or roundish. Europe (including Britain) and West Asia (Fig. 15 B)

R. foetida (*R. lutea*) Austrian Briar. June. Stems slender, with straight prickles. Lfts. ov., obov., $1\frac{1}{2}$, coarsely and unevenly toothed, dark green above, downy below. Fls. $2\frac{1}{2}$, orange or orange-red, solitary or in small clusters, unpleasantly scented. Fruit round, red. West Asia (Fig. 16 H.)

R. gallica. See under (1).

R. hibernica. Irish Rose. May–June. Stems erect, branches arching. Lfts. ov, 1, downy below. Fls $1\frac{1}{2}$, pink, solitary or in threes, smooth-stalked, sepals with expanded tips. Fruit $\frac{1}{2}$, round, red, calyx persistent. Ireland. (Fig. 16 E.)

R. Hugonis. April. Stems red, slender, arching, thorns straight and flattened. Lfts. ov., $\frac{3}{4}$, finely toothed. Fls. 2, yellow, solitary. Fruit $\frac{1}{2}$, round, blackish red, calyx persistent. China (Fig. 15 H.)

(*R. cantabrigiensis*, with fls. a little deeper yellow, is a cross between this and *R. sericea*).

R. omeiensis. Mount Omi Rose. May–June. Stems erect; prickles wide, flattened. Lfts. ov., 1, hairless or nearly so. Fls. $1\frac{1}{2}$, white. Fruit $\frac{1}{2}$, pear-shaped, bright red on thick yellow stalk. China.

R. pendulina (*R. alpina*). May–June. Stems slender; prickles few or none. Lfts. ov., 2, double-toothed, downy below. Fls. $1\frac{1}{2}$, purplish pink, solitary or in few-flowered clusters. Fruit 1, oblong, bright red, nodding. Europe.

R. rubrifolia (*R. ferruginea*). June–July. Stems and ls. purple. Fls. $1\frac{1}{2}$, deep red, in small clusters. Fruit $\frac{1}{2}$, round, red. Mountains of Central Europe.

R. rugosa. Ramanas Rose. June–July. Stems stout, very prickly. Lfts. ov., $1\frac{1}{2}$, toothed at outer end, wrinkled above, downy below. Fls. $3\frac{1}{2}$, purplish rose, solitary or in small clusters, very fragrant, sepals long and hairy. Fruit 1, bright red, with long persistent calyx. Japan. (Fig. 15 C.)

Variety *alba*. Fls. white.

Variety *flore pleno*. Fls. double.

R. sericea. See under (i).

R. spinosissima. Scotch or Burnet Rose. Dwarf bush up to 4 feet high, with creeping roots and erect short-branched thorny and bristly stems. Ls. closely set on branches; lfts. roundish ov., $\frac{1}{2}$, deep green, hairless. Fls. 2, white or pink, solitary. Fruit $\frac{1}{2}$, round, dark brown or black, calyx persistent. Europe (including Britain) and Siberia. (Fig. 16 F.)

Variety *lutea*. Fls. yellow.

RUBUS. Brambles. Stem usually prickly or bristly, often long and trailing.

RUBUS—continued

Ls. alternate, usually lobed or compound, stipules linear. Fls. white or pink, generally in terminal racemes or panicles, K_5 , C_5 , $A \infty$, $G \infty$ Fruit a compound berry consisting of a small rounded mass of 1-seeded fleshy carpels

(a) *Ls. simple*

- R. deliciosus* Rocky Mountain Bramble. May–June D Stem without prickles Ls ov., $2\frac{1}{2}$, 3-5-lobed, downy below Fls 2, white. Fruit $\frac{1}{2}$, dry, dark purple Rocky Mountains (Fig 26 J.)
- R. flagelliflorus* June E Prickles very small. Ls ov, 6, heart-shaped base, slightly lobed, finely toothed, velvety green above, white- or yellow-felted below Fls $\frac{1}{2}$, white, sepals red inside and conspicuous when reflexed. Fruit $\frac{1}{2}$, black China. (Fig 26 K.)
- R. odoratus* Purple-flowering Raspberry. June–August D. Stems pale brown, bark peeling Ls ov, 12, 5-lobed, hairy on both sides, velvety. Fls $2\frac{1}{2}$, bright pink or purple, in many-flowered racemes. Fruit $\frac{3}{4}$, flat, red North America
- R. parviflorus* (*R. nutkanus*) Salmon Berry. June D. Ls ov, 8, 3-5-lobed, hairy on both sides Fls 2, white, in few-flowered branched clusters. Fruit $\frac{3}{4}$, red North America. (Fig. 31 D.)

(b) *Stems with thick white waxy coating*

- R. biflorus*. July. D Ls. 3-5-fol, lflets ov, 4, white-felted below. Fls white. Fruit yellow. Himalaya
- R. Guraldianus*. June. D. Ls. pinnate, 7-9-fol; lflets. ov, 2, white-felted below. Fls. purple. Fruit black. China.
- R. lasiostylus* June. D. Ls. 3-5-fol.; lflets. ov, 4, white-felted below. Fls. red. Fruit red. China.
- R. thibetanus*. June. D. Ls pinnate, 7-13-fol.; lflets. ov, 2, white- or grey-felted below, terminal one pinnately lobed. Fls. purple. Fruit black. China and Tibet.

(c) *Ls compound; stems without thick white waxy coating*

- R. australis*. Lawyer Vine. June. E. Stems slender, zigzagged. Ls. 3-fol. or consisting merely of three slender l.-stalks without lflets.; lflets. vary in size from $\frac{1}{4}$ to 5 Fls. white, pink, or yellow, in panicles; fragrant, unisexual. Fruit $\frac{1}{4}$, reddish orange. New Zealand. (Fig. 2 B.)
- R. caesius*. Dewberry. June–July. D. Ls. 3-fol.; lflets. ov., 3, green below Fls. white, in small clusters. Fruit of few large black carpels. Europe (including Britain). (Fig. 2 E.)
- R. fruticosus*. Common Bramble, Blackberry. July–August. D. Ls. 3-5-fol.; lflets. green below. Fls. white or pink, in few-flowered racemes. Fruit black. Europe (including Britain). (Fig. 6 A.)
- R. Idaeus*. Raspberry. May–June. D. Stems erect, numerous, suckering freely; with very small prickles Ls. pinnate; lflets. white below. Fls. small, white or pinkish. Fruit red and juicy. Europe (including Britain), West Asia. (Fig. 12 H.)
- R. laciniatus*. Cut-leaved Bramble. June–August. D. Stems angled. Ls.

RUBUS—*continued*

digitate, 5-fol., lflets. pinnately lobed or dissected, downy below. Fls. 1, pinkish white, in large terminal panicles. Fruit $\frac{1}{2}$, black, sweet. Origin unknown (Fig 20 E.)

R. loganobaccus Loganberry. May-June. D. Stems long, rambling, and prickly. Ls. pinnate, 5-fol.; lflets. ov., 4, downy or white-felted below. Fls. large, white or pinkish. Fruit 1, conical, purple. Hybrid.

R. phoenicolasus. Wineberry. July. D. Stems and l-stalks densely covered with reddish bristles. Ls. 3-fol., lflets. white-felted below, terminal one much the largest. Fls. pink, sepals much larger than petals. Fruit $\frac{3}{4}$, conical, bright red. China and Japan.

R. procerus. July-August. D. Very vigorous. Stems stout, grooved, with scattered reflexed prickles. Ls. 5-fol.; lflets. broadly ov., white-felted below. Fls. 1, white, in white-felted panicles, stamens very large. Fruit black. Europe.

(The so-called Himalaya Berry is probably this.)

R. spectabilis. April. D. Ls. 3-fol., lflets. ov., 4, hairless or nearly so. Fls. 1, purplish red, fragrant, solitary or a few together on old wood. Fruit large, egg-shaped, orange-yellow. West North America.

R. ulmifolius (*R. rusticanus*) July. D. Stems arching, grooved, plum-coloured, rooting freely at tips. Ls. 3-5-fol.; white-felted below. Fls. rosy red, in conspicuous cylindrical racemes or panicles. Fruit small, black. Europe (including Britain).

Variety *flore pleno*. Fls. double.

Variety *inermis*. Stems without prickles.

Variety *variegatus*. Veins of l. yellow.

(III) OVARY SUPERIOR; fruit fleshy, 1-seeded

(PLUM AND CHERRY SECTION)

DICHTOMANTHES TRISTANIAECARPA. 20. June. E. Young branchlets covered with white wool. Ls. alternate, ov., 4, entire, pointed, tapering base, dark green above, silky-hairy below, stalk very short. Fls. $\frac{1}{4}$, white, in terminal branched clusters, C₅, A₁₅₋₂₀, sepals enlarge and become fleshy, entirely enclosing fruit. China. (Fig. 117 N.)

NUTTALLIA (OSMARONIA) CERASIFORMIS. Oso Berry. 8. March. D. Numerous stems springing erect from ground. Ls. alternate, oblong, lanc., $3\frac{1}{2}$, entire, thin, downy and greyish below. Fls. $\frac{1}{2}$, white, in short stiff drooping racemes, often unisexual with the sexes on different trees. Fruit $\frac{3}{4}$, plum-like, purple. California. (Fig. 119 B.)

PRINSEPIA. Stem with axillary spines and chambered pith. Ls. alternate or in clusters. Fls. in small axillary clusters or racemes, K₅, C₅, A₁₀, G₁. Fruit a berry.

P. sinensis. 6. May. D. Ls. lanc., 3, entire or faintly toothed, margins fringed with fine hairs. Fls. $\frac{1}{2}$, yellow. Berry $\frac{3}{4}$, red, juicy. Manchuria.

P. uniflora. 6. April. D. Ls. linear, lanc., 2, minutely toothed or entire, hairless. Fls. $\frac{3}{4}$, white. Berry $\frac{1}{2}$, round, red or purple, juicy. China. (Fig. 52 L.)

PRINSEPIA—continued

- P. utilis*. 12 March–April. D Spines up to 2 long. Ls ov., lanc., 4, toothed, hairless. Fls $\frac{1}{2}$, white, fragrant, in short racemes Berry $\frac{1}{2}$, cylindrical, purple. Himalaya (Fig 93 D)

PRUNUS. Buds with numerous scales. Ls alternate or in clusters, simple, toothed, stipulate, leaf-scars broad Fls white, pink, or red, K₅, C₅, A ∞ , G₁. Fruit fleshy, containing one hard stone

(a) *Fls. in elongated racemes 2 inches or more in length* (LAUREL SECTION)

- P. Laurocerasus*. Cherry Laurel. 20 April E Ls oblong, lanc, 6, leathery, dark glossy green, finely and distantly toothed, tapering base, hairless, margins slightly recurved Fls $\frac{1}{2}$, white, in short erect racemes. Fruit $\frac{1}{4}$, egg-shaped, black East Europe, Orient (Fig. 90 A)

Variety *magnoliaefolia* Ls up to 12×4

- P. lusitanica*. Portugal Laurel 20 June E Branchlets hairless Ls oblong, ov, 5, rounded base, dark glossy green above, finely toothed, margins wavy, stalk usually red. Fls $\frac{1}{2}$, white, in long erect racemes Fruit $\frac{1}{4}$, egg-shaped, dark purple Spain and Portugal (Fig. 90 B)

- P. Padus* Bird Cherry. 50 May. D. Ls. ov, 5, shining green above, rounded or broadly tapering base, finely toothed, l-stalk with glands. Fls. $\frac{1}{2}$, white, in long drooping racemes with leafy stalks Fruit $\frac{1}{4}$, round, black, calyx deciduous Europe (including Britain), Asia (Fig. 90 C)

According to Messrs Stewart & Sons, Wimborne, there are two forms, long-racemed and short-racemed.

- P. serotina*. Rum Cherry. 100 May. D. Branchlets hairless. Ls. ov, lanc., 5, glossy above, teeth minute and incurved, often hairy along midrib below. Fls. $\frac{1}{2}$, white, in cylindrical racemes up to 6 long. Fruit $\frac{1}{4}$, black, calyx persistent. U.S.A (Fig 90 E.)

(b) *Fls. in clusters, or short racemes 2 inches or less in length*

(i) Fruit without groove or furrow (CHERRY SECTION)

- P. angustifolia*. Mountain Cherry, Chickasaw Plum. 10. March–April. D. Branchlets thin, zigzagged, reddish Ls. lanc., 1 $\frac{1}{2}$, finely and sharply toothed, glossy above, strongly keeled. Fls. $\frac{1}{2}$, white, short-stalked, in few-flowered clusters; sepals upright or spreading, hairless. Fruit $\frac{1}{2}$, round, red or yellow. North America. (Fig. 91 E.)

- P. Avium* (*Cerasus Avium*, *C sylvestris*). Gean, Mazzard, Wild Cherry. 60. May. D. Ls. oblong, ov., 6, unevenly toothed, slender-pointed, hairy on midrib and veins below, stalk with red glands Fls. 1, white, in drooping clusters, Fruit $\frac{3}{4}$, round, blackish red, sweet Europe (including Britain). (Fig 91 A.)

Variety *flore pleno*. Double-flowered Cherry.

- P. Cerasus* (*Cerasus vulgaris*). Wild Dwarf Cherry. 20. May. D. Young branchlets hairless. Ls. ov., 3, short-pointed, firm, finely and often doubly toothed, hairless. Fls. 1, white, long-stalked, in erect or semi-

PRUNUS—continued

- erect clusters Fruit round, blackish red, sour. Europe (including Britain). (Fig 91 C.)
 Variety *flore pleno*. Fls double
 Variety *salcifolia*. Ls long and narrow
- P. Conradinae* 25 February–March D. Young branchlets hairless Ls ov, oblong, 4, abruptly long-pointed, rounded base, sharply and doubly toothed, 10–12 pairs veins Fls 1, white or pinkish Fruit $\frac{1}{2}$, red, egg-shaped China (Fig 92 J)
- P. incana*. Willow Cherry 6 May D. Ls. lanc, 2, finely and sharply toothed, dark green above, whitish and hairy below, nearly stalkless Fls. $\frac{1}{2}$, rose-coloured Fruit $\frac{1}{2}$, round, red. Europe. (Fig. 91 F.)
- P. Lannesiana*. 30 April–May D. Branchlets pale grey, hairless Ls. ov, lanc, 5, long-pointed, sharply double-toothed, hairless. Fls. 1, pink or white, fragrant, in branched clusters or short racemes. Fruit egg-shaped, black Japan (Fig 91 G)
 Variety *albida*. Fls. white.
 Variety *amanogawa* Fls pale pink.
 Variety *amanogawa (erecta)*. Branches erect; fls. tinged with pink.
- P. Mahaleb (Cerasus Mahaleb)* St. Lucie Cherry. 40 May–June. D. Young branchlets downy. Ls. broadly ov. or circular, $2\frac{1}{2}$, abruptly pointed, finely toothed, rounded base. Fls. $\frac{1}{2}$, white, in elongated racemes up to 2 long Fruit $\frac{1}{4}$, egg-shaped, black. Europe. (Fig 91 D)
- P. pennsylvanica (Cerasus borealis)*. Wild Red Cherry 40. April–May. D Branchlets hairless, slender, reddish Ls ov, lanc., 4, long-pointed, finely and sharply toothed, hairless Fls. $\frac{1}{2}$, white, in clusters or short racemes. Fruit $\frac{1}{4}$, round, red North America. (Fig. 90 D.)
- P. serrulata (Cerasus serrulata)*. Japanese Cherry. 20 April–May. D. A small tree with wide-spreading, almost horizontal branches and smooth dark chestnut-brown bark. Branchlets hairless. Ls ov., lanc., 6, abruptly long-pointed, sharply toothed, somewhat glaucous below, stalk with glands. Fls. 2, white or tinged with pink, in short racemes. Fruit $\frac{1}{4}$, black. China and Japan. (Fig. 91 B.)
 Variety *alboplana*. Fls. double, white.
 Variety *fugenzo (James Veitch)*. Fls double, deep pink.
 Variety *hizakura* Fls. double, pale pink
 Variety *rosea* Weeping habit. Fls small, pink, very double.
 Variety *sachalinensis (P. Sargentii)*. Fls. single, pink.
 Variety *sekiyama*. Fls. double, rose-red, very large, late.
- P. sinensis (P. japonica)*. 5. May. D. Three buds in each l.-axil. Ls. ov., lanc., $2\frac{1}{2}$, long-pointed, finely toothed, hairless or nearly so. Fls. $\frac{1}{2}$, white or pink, short-stalked, in small clusters. Fruit $\frac{1}{2}$, red. China and Japan.
 Variety *flore pleno*. Fls. double. (Fig. 92 B.)
- P. subhirtella*. 30 April. D. Young branchlets downy. Ls. ov., 3, sharply, unevenly and often double-toothed, hairy on veins below. Fls. $\frac{3}{4}$, pink, in short-stalked clusters. Fruit black. Japan. (Fig. 92 A.)
 Variety *autumnalis*. Fls single, nearly white, blooms from October to Christmas.
 Variety *pendula (P. pendula)*. Rosebud Cherry, Weeping Cherry. Branchlets drooping, hairy.

PRUNUS—continued

(11) Fruit with groove or furrow (PLUM SECTION).

P. Amygdalus (*Amygdalus communis*) Almond 30 March D. Branchlets hairless, three buds in each l.-axil. Ls. folded in bud, lanc., 5, toothed, hairless, stalk with glands. Fls. 2, pink or white, solitary or in pairs, appearing before ls. Fruit 2, egg-shaped, compressed, covered with velvety down. South Europe (Fig. 92 D)

P. Armeniaca Apricot 30 April D. Bark reddish, branchlets brown. Ls. rolled in bud, broadly ov. or circular, 4, pointed, round-toothed. Fls. 1, white or pinkish, solitary, short-stalked. Fruit $1\frac{1}{4}$, round, yellow tinged with red. North China (Fig. 92 K.)

P. cerasifera Cherry Plum, Myrobalan 30. March D. Branches slender, sometimes spiny, hairless. Ls. rolled in bud, ov., 3, round-toothed, hairless, or nearly so. Fls. 1, white, solitary or in twos or threes. Fruit 1, red. Caucasus. (Fig. 92 E)

Variety *Pissardii* Ls. purple. Fls. pink. Fruit purple.

P. Davidiana 30 March. D. Like *P. Amygdalus*, but sepals hairless and fruit 1, round, yellowish. China (Fig. 92 F)

P. domestica (*P. communis*) Plum 20 April D. Ls. rolled in bud, ov., 3, evenly round-toothed, downy below. Fls. 1, white, short-stalked, solitary or in pairs. Fruit $1\frac{1}{2}$, egg-shaped, black with blue bloom. Origin uncertain (occasionally found wild in Britain) (Fig. 93 B.)

P. insititia Bullace. 20. April. D. Branches sometimes spiny; young branchlets downy. Ls. ov., 3, coarsely toothed, net-veined. Fls. 1, white. Fruit $1\frac{1}{2}$, round, often white or yellow (Bean). Europe, Orient. (Fig. 92 G)

Damson, Mirabella, and Greengage are crosses between this and *P. communis*

P. nana (*Amygdalus nana*). Dwarf Russian Almond. 3 April. D. Branchlets hairless; three buds in each l.-axil. Ls. rolled in bud, lanc., $3\frac{1}{2}$, sharply toothed, hairless. Fls. $\frac{1}{2}$, rosy red, stalkless. Fruit 1, dry, covered with velvety down, egg-shaped, compressed. South Russia. (Fig. 92 C.)

P. Persica (*Amygdalus Persica*) Peach 20. April. D. Branchlets hairless; three buds in each l.-axil, buds downy. Ls. rolled in bud, lanc., 6, long-pointed, finely toothed, hairless. Fls. $1\frac{1}{2}$, pink, short-stalked, solitary. Fruit 3, velvety, yellow with red. China (Fig. 92 H)

White and crimson, single and double-flowered forms in cultivation.

P. spinosa. Sloe, Blackthorn 15. April. D. Branchlets black, spiny. Ls. ov., lanc., $1\frac{1}{2}$, sharply toothed. Fls. $\frac{1}{2}$, white, solitary or in pairs, sometimes appearing before ls. Fruit $\frac{1}{2}$, round, blue to black, erect. Europe (including Britain), North Asia. (Fig. 93 A.)

Variety *flore pleno*. Fls. double.

P. triloba (*Amygdalus Lindleyi*). 15. March-April. D. Three buds in each l.-axil. Ls. broadly ov., long-pointed, often 3-lobed at apex, coarsely and doubly toothed, slightly hairy below. Fls. 1, pinkish white, solitary or in pairs. Fruit $\frac{1}{2}$, red, round, hairy. China. (Fig. 93 C.)

(IV) OVARY INFERIOR, fruit fleshy, with more than one seed

(APPLE AND PEAR SECTION)

AMELANCHIER. Buds long and narrow Ls. alternate, ov, toothed, rounded or heart-shaped base Fls. 1, white, in terminal racemes. Fruit a 4-10-seeded berry.

A. canadensis June Berry, Service Berry 30. April. D. Branches slender, lower ones drooping Ls. 3, evenly and sharply toothed, firm, very downy below when young, nearly hairless when older. Racemes many-flowered, nodding. Berry $\frac{1}{4}$, purplish black when ripe. North America. (Fig 87 M.)

Variety *Botryapium* Fls. finer and larger

A. vulgaris (*A. ovalis*, *A. rotundifolia*) Snowy Mespilus. 20. May D. Ls. 2, rounder than above, unevenly toothed or entire Fls. larger. Europe (Fig 87 L)

ARONIA. Chokeberry. Ls. alternate, finely and evenly toothed, tapering base, glands along midrib on upper side, rolled in bud. Fls. $\frac{1}{2}$, in small branched clusters.

A. (Pyrus) arbutifolia. 10. May D Ls. ov., $3\frac{1}{2}$, dark dull green above, grey-felted below, short-stalked Fls. white or pinkish. Fruit $\frac{1}{4}$, red. East North America (Fig 93 F.)

A. (Pyrus) melanocarpa. Black Chokeberry. 5 May. D Ls. obov., $3\frac{1}{2}$, dark glossy green above, nearly hairless below. Fls. white Fruit $\frac{1}{2}$, round, glossy black. East North America. (Fig. 93 G)

COTONEASTER Branchlets usually spreading and hairy. Ls. alternate or in clusters, entire, stiff, usually with hairs, short-stalked Fls. small, white or pinkish, solitary or in branched clusters at end of short side-shoots Fruit a red or black berry.

(a) Fls with upright petals

C. acuminata. 12. June D Ls. ov., $2\frac{1}{2}$, dull green above, pale green and downy below. Fls. pinkish, in few-flowered branched clusters Berry $\frac{1}{2}$, bright red. Himalaya.

C. adpressa 1. June. D. Ls. ov., $\frac{3}{4}$, dull green above, wavy margins. Berry red, 2-seeded. West China (Fig. 118 A)

C. bullata. 12. June. D. Branches few, long and arching. Ls. ov., 3, bright green above and swollen between veins, grey down on lower side. Fls. pinkish. Berry red, 4-5-seeded West China, Tibet. (Fig. 118 M.)

C. Dielsiana. 6. June. D. Like *C. Franchetii* (see below), but berries scarlet and branches more spreading and drooping. China.

C. divaricata. 6. June. D. Ls. ov., $\frac{3}{4}$, glossy dark green above, pale green below. Fls. pink. Berry egg-shaped, red, 2-seeded. China.

C. Franchetii. 10. June. E. Ls. ov., 1, veins in deep grooves, white-felted below. Fls. pinkish, with hairy sepals. Berry orange-red, 3-seeded. China. (Fig. 118 B.)

C. horizontalis. 3. June. D. Branches low, spreading, horizontal, covered with thick brown wool; branchlets in two opposite rows. Ls. roundish

COTONEASTER—*continued*

- ov, $\frac{1}{2}$, glossy above, nearly hairless below. Fls. pinkish. Berry red, 3-seeded Himalaya (Fig. 118 c)
- C. integerrima* 7. May. D Ls roundish ov, $1\frac{1}{2}$, glossy above, grey-felted below Fls pinkish, sepals hairless Berry red, 2-seeded. Mountains of Europe (Fig 118 D)
- C. moupinensis* 15. June D Like *C. bullata*, but ls smaller. Berry black. China
- C. nitens* 6. June D Like *C. divaricata*, but berry purplish black. China.
- C. rotundifolia* 8 June $\frac{1}{2}$ E Stiff upright branches, with branchlets often in two opposite rows Ls roundish ov, $\frac{1}{2}$, in two opposite rows. Fls. solitary. Berry red Himalaya (Fig 118 L)
- C. Simonsii* 12. June $\frac{1}{2}$ E. Branches rigid, both erect and spreading. Ls. ov., 1, dark green above, downy below Fls. white. Berry scarlet. Himalaya. (Fig. 118 H.)
- C. tomentosa* 12 June D Like *C. integerrima*, but ls larger and sepals hairy Mountains of Europe.

(b) *Fls. with spreading petals*

- C. bacillaris*. 40. May-June. D. Like *C. frigida* (see below), but berry purplish brown Himalaya
- C. buxifolia*. 2. June. E. Ls. ov, obov., $\frac{1}{2}$, dull green above, tawny down underneath. Berry $\frac{1}{4}$, pear-shaped, red Nilgiri Hills, South India. (Fig. 118 G.)
- C. Dammeri* Prostrate. May-June. E. Branches long, trailing and rooting. Ls. ov., 2, glossy dark green above, pale green below, hairless. Fls. $\frac{1}{2}$, white with purple stamens. Berry $\frac{1}{2}$, bright red, 5-seeded. China.
- C. frigida*. 40. June D. Branchlets becoming hairless. Ls. ov., lanc, 5, often rounded at end, dull green and hairless above, paler and at first woolly below. Fls. white, in flattish downy clusters Berry red, 2-seeded. Himalaya (Fig 118 P.)
- C. Harroviana*. 6. June. E. Branchlets turn almost black on side exposed to sun. Ls. ov, obov., $2\frac{1}{2}$, dark green above, pale yellowish wool below. Berry red China. (Fig. 118 J)
- C. Henryana*. 12. June. E. Branchlets purple, drooping. Ls. lanc., 4, pointed, veins in grooves, grey down beneath becoming tawny. Fls. white with purple stamens. Berry dark red. China (Fig. 118 N.)
- C. hupehensis* 8 June D. Very like *C. nummularia* (see below), but ls. mostly rounded at base, pointed, white-felted below and not so broad. China.
- C. Lindleyi*. 10. June. E. Ls. roundish ov., $2\frac{1}{2}$, rounded base, dark green above, grey-felted below. Fls. white, sepals grey-felted. Berry black. Himalaya.
- C. microphylla*. 3. June. E Branches rigid, spreading, very leafy. Ls. ov., $\frac{1}{2}$, glossy dark green above, grey and downy below. Fls. white with purple stamens. Berry red. Himalaya. (Fig. 118 E.)
- C. multiflora*. 12. May. D Branches slender, arching or drooping, purplish. Ls. ov. to roundish, 2, blunt-ended, becoming hairless below. Fls. white in many-flowered branching clusters. Berry red. China. (Fig. 118 O.)

COTONEASTER—*continued*

- C. nummularia* (*C. racemiflora*). 8. June D Branchlets slender, spreading, covered with grey down when young. Ls obov., oblong, 1, rounded at end, dark green and hairless above, grey-felted below. Fls. white, with yellow stamens Berry large, bright red, 2-seeded. Europe, Asia. (Fig. 118 Q)
- C. pannosa* 19. June-July E. Branches slender, arching, white-felted when young. Ls. ov., 1, dull green above, white-felted below. Fls. white, with purple stamens, in dense, many-flowered branched clusters. Berry dull red, 2-seeded. China (Fig. 118 F)
- C. salicifolia*. 12. June E. Branches spreading, woolly when young. Ls. lanc, $2\frac{1}{2}$, sharp-pointed, glossy and wrinkled above, greyish white below, with 5-12 pairs prominent veins Fls. small, white, with red stamens, in many-flowered branched clusters. Berry red, 2-3-seeded. West China

Variety *floccosa*. Silky-white floss on branchlets and under side of ls.

- C. serotina*. 10. July-August. E. Young shoots covered with white or tawny down. Ls. ov, 3, pointed, tapering base, dark green above. Fls small, white, with pinkish or reddish-brown stamens, in many-flowered branched clusters Berry bright red, egg-shaped, 2-3-seeded. West China. (Fig. 118 K.)

CRATAEGOMESPIBUS. Cross between hawthorn and medlar, resembling latter (see *Mespilus*), except that the fruits are smaller and the flower has less than thirty stamens.

- C. Dardari*. Bronvaux Medlar 25. May-June. D. Branches more spiny than *Mespilus*. Fls. $\frac{1}{2}$, white, in branched clusters. Fruit $\frac{1}{2}$, 1-3-seeded Graft hybrid.

Variety *Asnieresii* More like hawthorn, with lobed ls.

- C. grandiflora* (*Mespilus Smithii*) 25. May-June D. Ls. ov., 3, pointed, unevenly toothed, downy below. Fls 1, solitary or in few-flowered clusters. Fruit $\frac{1}{2}$, downy. Natural hybrid. (Fig. 88 B.)

CRATAEGUS. Stem with spines Ls. alternate, toothed or lobed, slender-stalked. Fls. white, pink, or red, in branched clusters, K₅, C₅, A₅-25, \bar{G} (1-5). Fruit a berry

(a) *Veins of ls extending to points of lobes or teeth, but not to the angles between*

- C. coccinea* (*C. rotundifolia*). Scarlet Haw. 20. May. D. Ls. ov., 3, generally with wedge-shaped base, finely toothed, shallowly lobed in outer half. Fls. $\frac{3}{4}$, white, sepals hairy, A₁₀. Berry $\frac{1}{2}$, red, round, drooping. East United States. (Fig. 35 E.)
- C. cordata*. Washington Thorn. 30. July. D. Ls. broadly ov., $2\frac{1}{2}$, heart-shaped base, sharply toothed. Fls. $\frac{1}{2}$, white, sepals hairless, A₂₀. Berry $\frac{1}{2}$, scarlet. North America. (Fig. 35 K.)
- C. Crus-galli*. Cockspur Thorn. 30. June. D. Branches rigid, spreading. Ls. obov., 3, wedge-shaped base, sharply toothed in outer half, hairless, stiff and somewhat leathery. Fls. $\frac{3}{4}$, white, A₁₀. Berry $\frac{1}{2}$, deep red. North America. (Fig. 88 A.)

CRATAEGUS—continued

- C. mollis* Red Haw 40. May D. Like *C. coccinea*, but ls. larger (up to 4), and lobes more numerous, longer-pointed, and more deeply lobed. Fls. with red centre, sepals with gland-tipped teeth. Berry $\frac{3}{4}$, red, pear-shaped, downy. East United States (Fig. 35 G)
- C. prunifolia* 20. June D. Like *C. Crus-galli*, but with glossy reddish-brown branchlets and glossy dark green ls. with reddish l.-stalks. Origin unknown.
- C. punctata* 40. May-June. D. Spines short and stout, or absent. Ls. obov., 4, round-ended, coarsely and unevenly toothed in outer half, narrowly wedge-shaped base, downy below. Fls. $\frac{3}{4}$, white, Azo Berry $\frac{3}{4}$, red, pear-shaped, dotted. East North America. (Fig 35 A)

(b) *Veins of ls. extending to angles between lobes or teeth*

- C. apifolia*. Parsley-leaved Thorn 15. April-May. D. Ls. broadly ov. or kidney-shaped, $1\frac{1}{2}$, 5-7-lobed, base of blade often continued into stalk. Fls. $\frac{3}{4}$, white. Berry $\frac{1}{2}$, scarlet, egg-shaped. South United States. (Fig. 35 D.)
- C. Azarolus* (*C. Aronia*). Azarole. 30. June. D. Spines few Ls obov., 3, wedge-shaped base, 3-5-lobed often to midrib, bright green above, downy below. Fls. $\frac{1}{2}$, white, Azo Berry 1, yellow or orange-red, tasting like an apple, 1-2-seeded. Orient. (Fig. 35 J.)
- C. monogyna* (*C. Oxyacantha*, sub-species *monogyna*). Hawthorn, Quick. 35. May-June. D. Ls. ov., 2, lobed nearly to midrib. Fls. $\frac{1}{2}$, white, A10, 1-styled. Berry $\frac{1}{2}$, egg-shaped, red, 1-seeded. Europe (including Britain). (Fig. 35 B)

Variety *praecox*. Glastonbury Thorn. Flowers in winter as well as in summer.

Variety *rosea*. Fls. double, red.

- C. mgra* Hungarian Thorn. 20. May. D. Spines short and stout, or absent. Ls. ov., 3, wedge-shaped base, shallowly 7-11-lobed, downy on both sides. Fls. $\frac{3}{4}$, white or pinkish, in many-flowered, branched clusters Berry $\frac{1}{2}$, glossy black. East Europe. (Fig 35 F)
- C. orientalis*. 25. June. D. Like *C. Azarolus*, but ls. duller above, with hairs on both sides, and 5-9-lobed. Orient.
- C. oxyacanthoides*. May. 15. May-June. D. Like *C. monogyna*, but less spiny and lobes of ls. usually shallower. Fls. 2-3-styled. Berry 2-3-seeded. Europe (including Britain), North Africa, West Asia. (Fig. 35 C.)
- Variety *coccinea*. Fls. red.
- Variety *coccinea plena*. Fls. double, red.
- C. tanacetifolia*. Tansy-leaved Thorn. 35. June. D. Spines few or none. Ls. 2, deeply cut into narrow oblong lobes, hairy on both sides. Fls. 1, white, fragrant, in rounded clusters. Berry 1, yellow or reddish, 5-seeded, apple-scented. West Asia. (Fig. 35 H.)

CYDONIA. Quince. Ls. alternate or in clusters, simple, stipules usually large. Fls. solitary or in small clusters, K₅, C₅, A ∞ , G (5). Fruit large, fleshy, many-seeded.

CYDONIA—continued

(a) *Branches spiny (except C sinensis), ls. toothed*

(CHAENOMELES)

C. cathayensis. 10 March–April D. Ls. lanc., 4, sharply toothed at outer end, downy and reddish below Fls $1\frac{1}{2}$, white. Fruit round, 6, yellowish green, stalkless China (Fig. 88 E)

C. japonica (*C. Maulei*). Dwarf Quince 3 April–May. D Branchlets very downy when young Ls. ov, obov, 2, hairless. Fls $1\frac{1}{2}$, orange-red or scarlet, in clusters on previous year's wood Fruit $1\frac{1}{2}$, yellow stained with red Japan (Fig. 88 C)

Variety *alba* Fls. white

C. lagenaria (*Pyrus japonica*) Japonica, Japanese Quince 10. January–May D. Ls. ov, $3\frac{1}{2}$, evenly toothed, dark glossy green above, hairless. Fls. $1\frac{1}{2}$, red, on old wood. Fruit round, $2\frac{1}{2}$, greenish yellow speckled with small dots. China and Japan (Fig. 88 D.)

Variety *alba*. Fls white tinged with rose.

Variety *sulphurea* Fls. yellowish white.

Variety *versicolor* Fls rose and salmon

C. sinensis. Chinese Quince. 20 May. D Like *C. oblonga* (see below), but ls. toothed and fruit oblong and woody China. (Fig. 88 F.)

(b) *Branches spineless, ls. entire*

C. oblonga (*C. vulgaris*) Common Quince. 20 May. D. Bark peeling on older trees; young branchlets covered with grey wool. Ls. ov., 3, downy below Fls 2, pink or white, solitary. Fruit golden yellow, about size and shape of pear. West Asia. (Fig. 117 L)

DOCYNIA (ERIOLOBUS) DELAVAYI. 30. April–May. E. Ls alternate, ov., lanc., 3, glossy green above, white-felted below, entire. Fls. 1, white, in clusters. Fruit 1, egg- or pear-shaped. China (Fig 119 C.)

* ERIOBOTRYA JAPONICA Loquat. 30 Autumn E. Branchlets thick, woolly. Ls alternate, ov., lanc, 12, crowded at end of shoot, coarsely and evenly toothed, wrinkled above, brown wool below, prominently parallel-veined. Fls. $\frac{3}{4}$, yellowish white, in stiff terminal panicles, stalk and sepals covered with brown wool, C5, A20, G (3–5) Fruit $1\frac{1}{2}$, yellow, oblong or pear-shaped. China and Japan. (Fig. 88 K)

MALUS Apple. Buds with few scales. Ls. simple, alternate, with lateral veins curved at ends except when lobed; leaf-scars narrow. Fls. white, pink, or red, solitary or in small, usually unbranched clusters, styles united in lower half. Fruit indented at junction with stalk, flesh mealy.

M. (Pyrus) baccata. Siberian Crab Apple. 40. May. D. Ls. rolled in bud, ov., $3\frac{1}{2}$, evenly toothed, slender-stalked. Fls. $1\frac{1}{2}$, white, slender-stalked. Fruit $\frac{1}{2}$, red or yellow. Himalaya to Japan. (Fig. 94 D.)

M. (Pyrus) coronaria. American Crab Apple. 30. May–June. D. Ls. folded in bud, ov., $4\frac{1}{2}$, often 3-lobed, deeply and unevenly toothed, stalk slender and downy. Fls. $1\frac{1}{2}$, pinkish, fragrant. Fruit 1, orange-shaped, yellowish green. East North America. (Fig. 94 E.)

Variety *ionensis* (*Malus ionensis*). Prairie States Crab Apple. Ls. thicker, woolly below.

MALUS—continued

- M. Eleyi* 30. May. D. Ls ov, 4, sharp-toothed, purple when young, later a rich green with purple veins and stalk. Fls. 1, red. Fruit 1, egg-shaped, deep purplish red, on slender stalk, calyx persistent. Hybrid (Fig. 94 c.)
- M. florentina* (*Pyrus crataegifolia*) Hawthorn-leaved Crab Apple 30. June. D. Ls folded in bud, ov, $2\frac{1}{2}$, lobed, rounded or heart-shaped base; stalk slender, reddish. Fls. $\frac{3}{4}$, white, on slender pink stalks. Fruit $\frac{1}{2}$, yellowish red. North Italy (Fig. 36 j.)
- M. floribunda* Japanese Crab Apple 30. April. D. Ls folded in bud, ov, 3, sharp-toothed, slender-stalked. Fls. $\frac{3}{4}$, pink. Fruit $\frac{3}{4}$, round, yellow or red, calyx deciduous. Japan (Fig. 94 k.)
 Variety *Arnoldiana* Ls and fls larger
 Variety *atrosanguinea* Fls deeper pink.
- M. Halhania* 15. May. D. Young branchlets purple, hairless. Ls rolled in bud, ov, 3, finely and somewhat distantly blunt-toothed, hairy on midrib above, otherwise hairless. Fls. $1\frac{1}{2}$, bright rose-pink, calyx lobes broadly ov. and shorter than tube, slender-stalked. Fruit $\frac{1}{2}$, pear-shaped, purplish red, calyx deciduous. West China. (Fig. 94 g.)
- M. Lemnnei* April–May. D. Like *M. Eleyi*, but fls larger. Hybrid.
- M. Pratti* 30. May. D. Ls ov., 6, rounded base, finely double-toothed, with 6–10 pairs veins. Fls. $\frac{3}{4}$, white, in many-flowered clusters. Fruit $\frac{1}{2}$, round, red or yellow, dotted. China.
- M. pumila* (*M. communis*, *Pyrus Malus*). Wild Crab Apple (origin of most cultivated apples by selection and grafting). 30. May. D. Young branchlets woolly. Ls rolled in bud, ov, 4, round-toothed, downy below, stalk stout and downy. Fls. 1, white tinged with pink. Fruit dented at both ends. Europe (including Britain). (Fig. 94 b.)
 Variety *aldenhamensis*. Young ls. purple. Fls. 1, red, semi-double. Fruit round, purplish red, calyx persistent.
 Variety *Dartmouth* or *Hyslop Crab* Fls. $1\frac{1}{2}$, white. Fruit $1\frac{1}{2}$, egg-shaped, reddish purple, plum-like.
 Variety *John Downie*. Fruit $1\frac{1}{2}$, egg-shaped, orange and scarlet.
 Variety *Niedzwetzkyana* Young bark reddish purple. L-stalk and midrib red. Fls. $\frac{3}{4}$, red. Fruit 2, round or conical, deep red.
- M. purpurea*. 30. April–May. D. Ls. ov, 3, blunt-toothed, slender-stalked, purple when unfolding, afterwards glossy green, with purple veins and stalk. Fls. 1, rosy crimson, with spreading oblong petals. Fruit $\frac{1}{2}$, round, light purple, calyx often deciduous. Hybrid. (Fig. 94 f.)
- M. (Pyrus) Sargentii*. 6. April–May. D. Branches often with spines. Ls. folded in bud, ov, 3, sharply toothed, sometimes 3-lobed. Fls. 1, white without pink when fully open, base of petals abruptly rounded. Fruit $\frac{1}{2}$, round, dark red. Japan. (Fig. 94 j.)
- M. Scheideckeri*. 30. May. D. Ls folded in bud, ov, 4, coarsely toothed, sometimes lobed. Fls. $1\frac{1}{2}$, pink, semi-double, on long downy stalks, in clusters. Fruit $\frac{1}{2}$, round, yellow. Hybrid.
- M. (Pyrus) spectabilis*. Chinese Crab Apple. 30. April–May. D. Ls. rolled in bud, ov. or roundish, $3\frac{1}{2}$, toothed, short-pointed, glossy green above. Fls. 2, pink, on long downy stalks in clusters borne in great profusion. Fruit $\frac{3}{4}$, roundish, yellow. China and Japan.
- M. (Pyrus) theifera*. 30. May. D. Ls. rolled in bud, ov., 4, sharply toothed,

MALUS—continued

- firm. Fls. $1\frac{1}{2}$, white or pinkish, fragrant. Fruit $\frac{1}{2}$, round, greenish yellow with red cheek. China to Assam. (Fig. 94 H)
- M. Sieboldii* (*Pyrus Toringo*) 15. May. D. Branches spreading, arching or drooping. Ls. folded in bud, ov., $2\frac{1}{2}$, unevenly toothed, often deeply 3-lobed, dull green above, downy on both sides. Fls. $\frac{1}{2}$, pink or red, on slender thread-like stalks in small clusters. Fruit $\frac{1}{4}$, round, red or brownish yellow, calyx deciduous. Japan. (Fig. 94 L)
- M. toringoides* (*M. transitoria*, *Pyrus toringoides*) 25. May. D. Ls. folded in bud, ov., lanc., 3, unevenly toothed, deeply lobed. Fls. 1, white, in branched clusters. Fruit $\frac{1}{2}$, round or pear-shaped, red and yellow. West China. (Fig. 31 C)
- M. (Pyrus) Tschmoski* 40. May. D. Ls. folded in bud, ov., 5, unevenly toothed, base rounded, grey-felted below. Fls. 1, white or pinkish, in clusters. Fruit 1, round, yellowish green flushed with purple, calyx persistent. Ls. have brilliant autumn tints. Japan.
- M. yunnanensis* 30. May. D. Like *M. Prattii*, but ls. more downy below and often shallowly lobed, turning brilliant colours in autumn. China.

MESPILUS GERMANICA. Medlar. 15. June. D. Stem with a few spines; young branchlets very hairy. Ls. alternate, ov., lanc., 5, minutely toothed or entire, hairy on both sides, stalk very short. Fls. 1, white or pink, solitary on very short woolly stalk. Fruit $1\frac{1}{2}$, hairy, 5-celled, open at top, surrounded by persistent hairy calyx. Europe. (Fig. 88 L.)

OSTEOMELES ANTHYLLIDIFOLIA (O. SCHWERINAE) 8. June. D. Branches long and slender, covered with silky hairs. Ls. alternate, pinnate; lfts. ov., $\frac{1}{2}$, hairy; common l.-stalk grooved and slightly winged. Fls. $\frac{1}{2}$, white, in terminal open flattish panicles. Fruit a black berry. West China. (Fig. 14 L.)

PERAPHYLLUM RAMOSISSIMUM. 6. May. D. Ls. alternate or in clusters, oblanc., 2, entire or with a few teeth, stalkless or nearly so. Fls. $\frac{3}{4}$, white, with pink centre, K₅, C₅, A₂₀, in few-flowered terminal branched clusters. Fruit a yellow berry with reddish cheek. Oregon to Colorado.

PHOTINIA. Ls. alternate, finely toothed, usually crowded at end of branch. Fls. white, in short branched clusters or panicles, K₅, C₅, A₁₀₋₂₀. Fruit red, haw-like.

(a) *Ls. leathery, evergreen*

- * *P. arbutifolia* (*Heteromeles arbutifolia*). Toyon, Tollyon. 30. June. Ls. oblong, lanc., 4, tapering base, hairless, teeth gland-tipped, stalk thick and downy. Fls. $\frac{1}{2}$, stamens ten. California. (Fig. 89 E.)
- P. Davidsoniae* 45. June. Young shoots reddish. Ls. ov., lanc., 6, tapering base, stalk $\frac{1}{2}$ long. Fls. $\frac{1}{2}$, stamens twenty. China. (Fig. 89 F.)
- P. serrulata*. Chinese Hawthorn. 40. April-May. Branchlets stout, hairless. Ls. lanc., 8, rounded base, stalk $1\frac{1}{2}$ long. Fls. $\frac{1}{2}$, stamens twenty. China. (Fig. 89 C.)

(b) *Ls. thin, deciduous*

- P. villosa* (*Pourthaea arguta*). 15. May. D. Ls. ov., lanc., $3\frac{1}{2}$, tapering base, long-pointed, hairy below, 5-7 pairs prominent veins, short-stalked. Fl. $\frac{1}{2}$, stamens twenty, stalk warted, panicles downy. China and Japan. (Fig. 89 D.)

PYRACANTHA. Firethorn. Branches spiny. Ls. alternate or in clusters. Fls. small, white, in branched clusters. Fruit a 5-seeded berry.

P. (Cotoneaster) angustifolia. 12. June E. Branches rigid, spreading, downy. Ls. lanc, linear, 2, minutely toothed or entire, dark green above, grey-felted below. Fls. $\frac{1}{4}$ Berry $\frac{1}{4}$, orange-yellow. China. (Fig. 52 E.)

P. coccinea 15. June E. Ls. ov., lanc., $2\frac{1}{2}$, blunt-toothed, hairless below. Fls. $\frac{1}{4}$, with hairy stalks. Berry $\frac{1}{4}$, orange-shaped, coral-red. South Europe (Fig. 88 H)

Variety *Lalandii*. More upright and vigorous. Ls. wider. Berries brighter.

P. crenulata Nepalese White Thorn. 15. June. E. Ls. lanc, $1\frac{1}{2}$, toothed towards apex, hairless Fls. $\frac{1}{4}$, with hairless stalks Berry round, yellow to orange-red. Himalaya

Variety *Gibbsii* (*P. Gibbsii*, *P. yunnanensis*) Ls. obov., 3, blunt-ended, round-toothed. Fls. larger. Berry red China (Fig. 88 J)

Variety *Rogersiana* (*P. Rogersiana*). Ls. narrowly oblanc., 2. Hardier and more showy than parent. (Fig. 88 G.)

PYRUS Pear Ls. simple, alternate, with lateral veins curved at ends; leaf-scars narrow. Fls. white, in small, usually unbranched clusters, styles free to base. Fruit not indented at junction with stalk, flesh gritty.

P. communis. Wild Pear (origin of cultivated pears). 40. April D. Branchlets with short stiff spurs, sometimes spiny. Ls. ov., 4, short-pointed, round-toothed. Fls. 1, in small branched clusters. Europe (including Britain), Asia. (Fig. 94 A.)

Variety *cordata*. Ls. $1\frac{1}{2}$. Fls. in racemes. Fruit round, brown with white spots.

P. Pashia. 35. April-May. D. Often spiny. Ls. ov., 4, rounded base, round-toothed, long-stalked. Fls. $\frac{3}{4}$, pink at first, in rounded branched clusters. Fruit 1, round, rough, brown with white spots. Himalaya.

Variety *kumaoni*. Ls. and fl.-stalks hairless.

P. salicifolia. Willow-leaved Pear 25. April. D. Ls. lanc, $3\frac{1}{2}$, entire, silvery grey, short-stalked. Fls. $\frac{3}{4}$, in small rounded branched clusters. Fruit $\frac{1}{2}$. Levant. (Fig. 119 D.)

Variety *pendula*. Branches drooping.

RAPHIOLEPIS. Ls. alternate, roundish ov., 3, thick and leathery, distantly toothed in outer half, crowded radially at end of shoots. Fls. $\frac{3}{4}$, in erect terminal panicles or racemes, K5, C5, A15-20, \bar{G} (2-3). Fruit $\frac{1}{2}$, bluish black.

* *R. Delacourii.* 10. June. E. Fls. pink.

R. japonica. 10. June. E. Fls. white. (Fig. 89 A.)

SORBUS. Buds large, with overlapping scales. Ls. alternate, simple with straight veins or compound with curved veins Fls. small, white, in large flattish branched clusters. Fruit small and berry-like.

(a) *Ls. simple*

S. Aria (*Pyrus Aria*, *Aria nivea*). White Beam. 45. May. D. Branchlets shining dark brown, warted; buds green, elongated. Ls. ov., 4, double-

SORBUS—*continued*

toothed, bright green above, white-felted below. Fruit $\frac{1}{2}$, red, spotted North Temperate Zone (including Britain) (Fig 93 H.)

Variety *lutescens*. Ls yellowish

S. hybrida (*S. pinnatifida*). Bastard Service Tree. 40 May. D. Branchlets dark shining brown at end of season Ls ov., 3, pinnately lobed, toothed, grey down beneath Fruit $\frac{1}{2}$, egg-shaped, red Europe (Fig 36 L.)

S. torminalis (*Pyrus torminalis*) Wild Service 70. May. D Buds green, round. Ls ov., 5, with three to four pointed lobes on each side, double-toothed, slender-stalked. Fruit $\frac{1}{2}$, egg-shaped, brownish. Europe (including Britain). (Fig 36 K)

(b) *Ls pinnate*

S. aucuparia (*Pyrus aucuparia*). Mountain Ash, Rowan 60 May D. Buds woolly. Lfts lanc., 2, sharply toothed. Fruit $\frac{1}{4}$, bright red. North Hemisphere (including Britain) (Fig 11 A)

S. domestica (*Pyrus sorbus*) Service Tree 150. May-June. D. Buds hairless, sticky, and shining Lfts oblong, lanc, $2\frac{1}{2}$, often rounded at end, toothed in outer half Fls $\frac{1}{2}$, in panicles. Fruit 1, pear-shaped, green or brown tinged with red Europe. (Fig 11 B)

STRANVAESIA. Ls. alternate, lanc, $3\frac{1}{2}$, leathery, hairless or nearly so, finely toothed or entire. Fls $\frac{1}{2}$, white, in terminal many-flowered, branched clusters. Fruit a red berry.

S. glaucescens (*S. nussia*). 20. July E. Ls. finely toothed. Fruit $\frac{1}{4}$, pear-shaped. Himalaya. (Fig. 89 B)

S. davidiana. 20. June. E. Ls entire, stalk red and hairy. China. (Fig. 119 E.)

Variety *salicifolia* (*S. salicifolia*). Ls. narrow-lanc.

Variety *undulata* (*S. undulata*). L-margins wavy, berry orange.

Family 44 SAXIFRAGACEAE. K4-6, C4-6, A4-∞, G̅ (2-5)

Ls. without stipules. Fls. of regular shape.

* ANOPTERUS GLANDULOSA. Tasmanian Laurel. 40. May. E. Young shoots stout, hairless. Ls. alternate, oblanc., 5, tapering gradually to base, leathery, coarsely toothed, teeth gland-tipped, dark glossy green, hairless, short-stalked, crowded at end of shoot. Fls $\frac{1}{2}$, white, cup-shaped, in terminal racemes, K6, C6, A6, G̅1. Fruit $\frac{1}{2}$, slender, erect, splitting into recurved halves. Tasmania (Fig. 60 L.)

* CARPENTERIA CALIFORNICA. Californian Mock Orange 8. June-July. .E. Branchlets pithy, pale and downy. Ls. opposite, lanc., 4, tapering at both ends, entire, bright green above, grey-felted below, very shortly stalked. Fls. 2, white, in terminal clusters, stamens yellow, K (5), C5-6, A ∞, G̅ (5). Fruit conical, leathery, splitting into five to seven parts California. (Fig. 73 E)

* CARPODETUS SERRATUS. 30. May-June. E. Branches spreading, often flattened; branchlets downy. Ls. alternate, ov., 1, sharply and somewhat distantly toothed, 2-4 pairs lateral veins, bright green and with scattered hairs above, pale and downy below, rounded base, slender-stalked. Fls. very small, white, in small

axillary branched clusters. Fruit $\frac{1}{4}$, round, black and shining. New Zealand. (Fig 96 P.)

DECUMARIA BARBARA. Climber to 30 June. D Aerial roots. Buds hairy. Ls. opposite, ov, 5, vaguely toothed in outer half or entire, hairless, slender-stalked. Fls. $\frac{1}{4}$, white, in erect terminal branched clusters, K7-10, C7-10, A ∞ , \bar{G} (5-10). Fruit $\frac{1}{2}$, urn-shaped, lower part striped with white. South United States. (Fig 61 M)

DEUTZIA Stems brown, peeling, buds hairless. Ls. opposite, toothed, thin, scurfy with minute star-shaped hairs on both surfaces, wither rapidly Fls. white or pink, K5, C5, A5+5, \bar{G} (3-5) Fruit dry, splitting into three to five parts.

(a) *Ls. grey or white below*

D. discolor 6. June. D. Ls. ov., oblong, 4, finely and evenly toothed, dull green above, grey below Fls. $\frac{3}{4}$, white or pinkish, in branched clusters. China. (Fig 61 G.)

Variety *major*. Sprays of fl -clusters on long arching stems

D. longifolia 6 June D Ls. lanc, 5, long-pointed, finely toothed, greyish green above, greyish white below, prominently veined. Fls. 1, pink or purplish, in branched clusters, wings of inner stamens deeply 2-lobed at top China. (Fig. 61 J)

D. setchuenensis. 6. May-June D. Ls. ov., lanc, 4, dull green and rough above, grey and downy below, base rounded, finely toothed. Fls. $\frac{1}{2}$, white, in branched clusters wings of longer stamens end in two prominent teeth. China. (Fig. 61 L.)

D. Vilmorinae. 8. June. D. Ls. oblong, lanc., 5, slender-pointed, sharply toothed, dark dull green above, grey-felted below. Fls. 1, white, in broad panicles, petals with upturned edges, wings of stamens broad in middle. China.

(b) *Ls. green below*

D. corymbosa. 9. June-July. D. Ls. ov., 5, long-pointed, finely toothed. Fls. $\frac{1}{2}$, white, crowded in broad panicles, wings of stamens toothed. Himalaya.

D. gracilis. 4. May-June. D. Ls. lanc., 3, coarsely and unevenly toothed, deep green, Fls. $\frac{3}{4}$, white, in erect racemes. Japan. (Fig. 61 K)

Variety *rosea* Fls. pinkish purple.

D. scabra (*D. crenata*). 10. June-July. D. Ls. ov., lanc., 4, finely toothed, teeth standing upwards or inwards. Fls. $\frac{1}{2}$, white or pinkish in erect panicles, petals erect. China and Japan. (Fig. 61 H.)

Variety *flore pleno*. Fls. 1, double.

Variety *Watereri*. Fls. 1, single, petals pink outside.

ESCALLONIA. Chilean Gum Box. Ls. alternate, finely toothed, gland-dotted, usually clammy, stalkless or nearly so. Fls. small, white, pink, or red, in panicles or racemes, K (5), C5, A5, \bar{G} (2-3). Fruit dry, top-shaped, surmounted by persistent style.

(a) *Fls. white*

E. exoniensis. 20. July-October. E. Branches ribbed, downy. Ls. obov., 1, double-toothed, glossy, hairless except on midrib below. Fls. tubular, in small terminal panicles. Hybrid. (Fig. 96 A.)

ESCALLONIA—continued

- * *E. floribunda* 10. July–August. E. Stems clammy. Ls. lanc., 3, often notched at apex, minutely toothed or entire, very shortly stalked. Fls. $\frac{1}{2}$, not tubular, in large terminal panicles up to 9 long. South America.
- * *E. illmta* 10. August. E. Stem with stalked glands. Ls. obov., 2, very shortly stalked. Fls. tubular, in terminal panicles, possess faint smell of pigsty. Chile. (Fig. 96 K.)
- E. Iveyi*. 10. August–October. E. Young stems angular. Ls. ov., $2\frac{1}{2}$, rounded at apex, very glossy. Fls. $\frac{1}{2}$, tubular, in terminal panicles, petals recurved. Hybrid. (Fig. 96 L.)
- * *E. montevidensis* 10. September. E. Ls. lanc., 3, often notched at apex, minutely toothed or entire, very shortly stalked. Fls. 1, not tubular, in rounded trusses, style long and conspicuous. South America. (Fig. 96 G.)
- E. Philippiana (E. virgata)* 8. June–August. D. Stems brown, very leafy, often arching. Ls. oblanc., $\frac{1}{2}$, toothed at outer end, hairless. Fls. $\frac{1}{2}$, in leafy racemes up to $1\frac{1}{2}$ long. Chile. (Fig. 96 B.)
- * *E. pterocladon* 8. July–August. E. Stems angled, downy. Ls. oblanc., 1, hairless except on midrib above. Fls. $\frac{1}{4}$, tubular, in slender racemes, fragrant. South America. (Fig. 96 O.)
- * *E. pulverulenta* 12. July–September. E. Stems downy, very clammy. Ls. oblanc., 4, very clammy, hairy on both sides. Fls. densely crowded in cylindrical racemes up to 9 long. Chile. (Fig. 96 N.)
- * *E. revoluta*. 20. June–August. E. Stems and ls. grey-felted. Ls. ov., 2, unevenly toothed. Fls. $\frac{1}{2}$, tubular, in short racemes or panicles. Chile. (Fig. 96 J.)
- * *E. viscosa*. 10. June–August. E. Branchlets drooping; stems clammy. Ls. obov., 3. Fls. $\frac{1}{2}$, in open drooping panicles, with strong smell of pigsty. Chile. (Fig. 96 M.)

(b) Fls. red or pink

- E. edinensis*. 10. June–August. $\frac{1}{2}$ E. Stems often arching. Ls. obov., $1\frac{1}{2}$, toothed at outer end, hairless. Fls. $\frac{1}{2}$, pink, in racemes. Hybrid. (Fig. 96 C.)
- E. Ingrami*. 10. June–September. E. Stems downy, clammy. Ls. ov., 2, double-toothed, hairless. Fls. $\frac{1}{4}$, tubular, red, in small terminal panicles. Chile. (Fig. 96 E.)
- E. Langleyensis*. 8. June–September. $\frac{1}{2}$ E. Stems long, slender, arching, with stalked glands. Ls. obov., 1, hairless. Fls. $\frac{1}{2}$, red, funnel-shaped, in short few-flowered racemes. Hybrid. (Fig. 96 D.)
- E. macrantha*. 10. June–September. E. Stems downy, clammy. Ls. broadly ov., 3, double-toothed, hairless. Fls. $\frac{1}{2}$, tubular, in terminal racemes up to 4 long. Chile. (Fig. 96 F.)

Variety *C. F. Ball*. Much hardier; fls. larger.

- E. rubra*. 15. July–August. E. Stems reddish, downy, clammy. Ls. obov., lanc., $1\frac{1}{2}$, double-toothed at outer end. Fls. $\frac{1}{2}$, red, tubular, in loose terminal panicles. Chile. (Fig. 96 H.)

FENDLERIA RUPICOLA. 6. May–June. D. Stems ribbed. Ls. opposite, ov., $\frac{3}{4}$, entire, 3-ribbed, hairy, stalkless or nearly so. Fls. $1\frac{1}{2}$, white or tinged with pink outside, K₄, C₄, A₈, G₄ (4). Fruit dry, $\frac{1}{2}$, light brown. South-west United States. (Fig. 67 B.)

HYDRANGEA Bark peeling; branchlets bright brown, pithy. Ls. opposite, toothed, prominently veined. Fls. usually in flattish or rounded terminal branched clusters, outer fls. usually sterile and much larger than those in the centre. Fruit dry, 2-5-celled, splitting at top.

(a) *Fls. in pyramidal panicles*

H. paniculata 15. August–September. D. Ls. often in threes, ov., 6, toothed, with scattered hairs. Outer fls. white changing to purple-pink, inner fls. yellowish white. Japan. (Fig. 55 B.)

H. quercifolia Grey Beard 3 July. D. Young stems woolly. Ls. ov. or circular, 4, 5-7-lobed, minutely toothed, downy below. Outer fls. 1½, white changing to purple. South United States. (Fig. 34 K.)

(b) *Fls. in flattish or rounded branched clusters*

H. arborescens, variety *grandiflora* 4. July–August. D. Ls. ov., or circular, 6, short-pointed, coarsely toothed, hairless except on veins or in vein-axils. Fl.-clusters flattish; all fls. sterile, large, white. East United States

H. Bretschneideri. 10 July. D. Ls. ov., 5, long-pointed, evenly toothed. Fl.-clusters flattish, outer fls. white, changing to pink, inner fls. dull white. China. (Fig. 58 F.)

H. Davidii. 6. July. D. Young stems slender, downy. Ls. lanc., 6, tapered at both ends; apex long, slender and curved, coarsely toothed. Outer fls. white, inner pale blue; clusters stalkless. China. (Fig. 58 B.)

* *H. hortensis* (*H. opuloides*). 8. July–September. D. Ls. ov., 6, coarsely toothed, pale bright green, hairless or nearly so. Outer fls. pink or blue. China and Japan. (Fig. 58 A.)

(Most garden Hydrangeas—in which the fls. are all sterile—are derived from this.)

Variety *Mariesii*. Outer fls. mauve-pink, inner pinkish white.

Variety *nigra* (*H. cyanoclada*). Stems dark purple. Fls. mostly sterile, rose-coloured.

H. involucrata. 1½. August–October. D. Stems and ls. downy. Ls. ov., 3, rough above, teeth bristle-like. Outer fls. white or blue-white, inner blue. Japan. (Fig. 58 G.)

H. petiolaris. Climber. July–August. D. Aerial roots. Ls. ov., 3, sharply and evenly toothed, nearly hairless, long-stalked. Fls. white. Japan. (Fig. 58 C.)

H. radiata. 5. July–August. D. Ls. ov., 6, dark green above, white-felted below. Fls. white. South-east United States.

H. Sargentiana. 6. July–August. D. Stems very bristly. Ls. ov., 10, net-veined, bristly. Outer fls. pinkish white, inner rosy lilac. China. (Fig. 58 E.)

H. villosa. 9. July–August. D. Stems angular, hairy. Ls. lanc., 9, dull green and bristly above, grey down below. Outer fls. blue or white, with four toothed petals (bracts); inner fls. white. China. (Fig. 58 D.)

ITEA. Branchlets with chambered pith. Ls. alternate, toothed, short-stalked. Fls. small, in long narrow spikes, K (5), C₅, A₅, \bar{G} (2). Fruit ¼, dry, 2-grooved.

I. ilicifolia. 18. August. E. Ls. broadly ov., 4, spiny-toothed, glossy above,

ITEA—continued

hairless except for axil tufts below. Fls. greenish white, in drooping spikes up to 12 long China. (Fig 97 A.)

I. virginica. 5. July. D. Ls. narrowly ov, lanc, 3, finely toothed, downy below. Fls creamy white, fragrant, in erect spikes up to 6 long. East United States. (Fig. 97 B)

JAMESIA AMERICANA. 7. May D. Stems bright brown, stout, pithy, bark peeling. Ls. opposite, ov., 2, coarsely and evenly toothed, very hairy Fls $\frac{1}{2}$, white, in erect terminal panicles, K5, C5, A10, G1. Rocky Mountains. (Fig 61 E.)

PHILADELPHUS. Mock Orange, *Syringa* Stems with solid white pith. Ls. opposite, distantly toothed, 3-5-nerved or with chief veins arising near base, short-stalked. Fls. usually white, in terminal racemes or branched clusters at end of side-shoots, K4, C4, A ∞ , G (3-5). Fruit dry, 4-celled, with numerous seeds

(a) Fls. in racemes or clusters of five or more

P. coronarius. 12. June D. Ls. ov, lanc, 4, nearly hairless. Fls 1, white, heavy-scented, in terminal 5-9-flowered racemes Asia (Fig 61 A.)

Variety *flore pleno*. Fls. double

Variety *folius aureis* Ls yellow.

Variety *variegatus*. Ls. with white border.

P. Delavayi. 10. June. D. Ls. ov, 3, rounded or heart-shaped base, white-felted below. Fls 1, white, fragrant, in 7-11-flowered racemes, calyx purple, hairless. China. (Fig 61 C.)

P. Lemoinei. 6. June. D. Ls ov., 2 $\frac{1}{2}$, coarsely toothed, hairy. Fls 1, white, fragrant, in 5-9-flowered racemes at end of leafy shoots. Hybrid.

Variety *Virginal*. Fls 2, double

P. Lewisii. 12 July. D. Branchlets greyish brown, drooping, not peeling. Ls. ov., lanc, 4, coarsely toothed or entire, scattered hairs below Fls. 1 $\frac{1}{2}$, white, scentless, in 5-9-flowered racemes. West United States. (Fig. 61 B.)

(b) Fls. solitary or in threes

P. grandiflorus. 15. June-July. D. Ls. ov., lanc., 5, slender-pointed, sharply toothed, bristly along chief veins. Fls. 2, white, scentless. South United States.

P. microphyllus. 4. June. D. Branchlets slender, rigid, downy. Ls. ov., lanc., $\frac{3}{4}$, entire, bright green above, grey and hairy below. Fls. white, very fragrant. Colorado and Arizona. (Fig. 67 A.)

P. purpureo-maculatus. 6. June. D. Branchlets reddish brown, hairy. Ls. ov. or nearly circular, 1 $\frac{1}{2}$, 1-3-toothed on either side, hairy. Fls. 1 $\frac{1}{2}$, white with purple blotch at base of each petal, fragrant. Hybrid. (Fig. 61 D.)

PILEOSTEGIA VIBURNOIDES. 20. September-October. E. Prostrate or climbing. Ls. opposite, lanc., 6, pointed, tapering base, strongly veined and keeled, minutely pitted below. Fls. $\frac{1}{4}$, white, with conspicuous white stamens; densely crowded in terminal panicles up to 6 long. Fruit small, dry, top-shaped. India (Khasi Hills). (Fig. 76 C.)

RIBES. Currants and Gooseberries. Ls. alternate or in clusters, palmately

RIBES—*continued*

lobed, toothed Fls small, K (5), C₅, A₅, \bar{G} ₁. Sepals often petaloid, giving appearance of gamopetalous fls. Fruit a juicy berry.

(a) *Stems spiny (Gooseberry Section)*

- R. Grossularia* Common Gooseberry. 3 April D Stems and spines stout. Ls ov., 2 Fls greenish, solitary or in small clusters. Europe (including Britain), North Africa (Fig 26 D)
- R. leptanthum*. 4 April D Stems and spines slender Ls. broadly ov or kidney-shaped, $\frac{3}{4}$, deeply 3-5-lobed, slender-stalked (stalk as long as blade) Fls white tinged with pink, solitary or in small clusters. Berry dark red Colorado, New Mexico.
- R. Lobbu* 6 April-May D Ls roundish, 2. 3-5-lobed. Fls with purple recurved sepals and white petals, in pairs. Berry oblong, reddish brown. California
- R. Menziesii* 6 April D Stems bristly Ls. roundish ov, 2. Fls. with reddish-purple sepals and white or pinkish petals; in pairs or solitary. Berry round, bristly West North America.
- R. speciosum* (*R. fuchsoides*). Fuchsia-flowered Gooseberry 9. April. D. Young stems with gland-tipped bristles Ls 1, 3-5-lobed, straight or tapering base, slender-stalked. Fls red, in drooping clusters; stamens four, long and drooping California (Fig 26 E.)

(b) *Stems without spines (Currant Section)*

- R. alpinum*. Alpine Currant 9 April D. Twigs shining. Ls. broadly ov, 1, with scattered hairs. Fls greenish white, unisexual, in erect racemes. Fruit red, not edible North Hemisphere (including Britain).
- R. americanum* (*R. missouriense* ?) American Black Currant. 3. April. D Ls. 3, heart-shaped base, gland-dotted below, odorous. Fls. yellowish white, funnel-shaped, in nodding racemes. North America.
- R. aureum* Buffalo Currant. Golden Currant. 8. April. D. Ls. 2, with straight or tapering base, hairless or nearly so. Fls tubular, bright yellow, fragrant, in drooping racemes. Fruit purplish black. West North America. (Fig. 26 G.)
- R. fasciculatum*. 5 April D. Ls. 2, stalk with feathered bristles near base. Fls. yellow, fragrant, solitary or in small erect clusters. Japan.
- R. nigrum* Black Currant. 6 April. D. Ls. 4, gland-dotted below, odorous. Fls. dull white, bell-shaped, in nodding racemes on young wood. North Europe (including Britain), North Asia
- Varieties *dissectum* and *laciniatum*. Cut-leaved forms.
- R. rubrum* (*R. sativum*). Red Currant. 3. April. D. Ls. 3, 3-5-lobed, heart-shaped base, downy below. Fls. greenish yellow, in drooping racemes on old wood. North Europe (including Britain). (Fig 26 F.)
- R. sanguineum*. Flowering Currant. 8. March-April. D. Branchlets pink. Ls. 4, heart-shaped base, whitish below. Fls. rosy red, in drooping or ascending racemes. Fruit covered with blue bloom. California. (Fig 26 H)
- Variety *albidum*. Fls. white.
- Variety *atrorubens*. Fls. deep red, small.
- Variety *Brocklebankii*. Ls. yellow.
- Variety *splendens*. Fls. blood red.

RIBES—continued

R. viburnifolium. 8 April. E. Ls ov, $1\frac{1}{2}$, blunt-ended, not lobed, glossy above, coarsely toothed, resin-dotted below, odorous when rubbed, shortly stalked Fls. pink, in short erect racemes California (Fig 97 c.)

SCHIZOPHRAGMA Climbing by aerial roots Ls opposite, ov, toothed, long-stalked Fls yellowish white, similar to Hydrangea, but outer fls have one large bract only.

S. hydrangeoides 40. July. D Young stems reddish, hairless Ls broadly ov, 4, coarsely and evenly toothed, deep green above, silky hairs below. China and Japan (Fig 58 H)

S. integrifolia 30 July D Ls 6, minutely and distantly toothed. China

* WEINMANNIA TRICHOSPERMA 40 May E Ls opposite, pinnate, lfts $\frac{3}{4}$, toothed; triangular wing on each side of common stalk between each pair of lfts. Fls small, white, fragrant, in short racemes (resembling mignonette). Chile (Fig 8 D)

Family 45. HAMAMELIDACEAE K (4-5), C4-5 or 0, A4-5, G (2)

Ls. alternate, simple, stipulate Fls small, in heads or racemes. Fruit woody, 2-celled.

CORYLOPSIS Ls ov., 4, with prominent parallel veins reaching to margin which is finely and distantly toothed, straight or slightly heart-shaped base, slender-stalked Fls. yellowish, in drooping catkins, K5, C5, A5.

C. pauciflora 4 March-April. D Branchlets and ls. hairless or nearly so Fls in 2-3-flowered catkins Japan

C. spicata 6. March-April. D. Branchlets and ls. downy L-stalk woolly. Fls. in 7-10-flowered catkins up to $1\frac{1}{2}$ long, fragrant Japan. (Fig. 97 E)

C. Willmottiae. 12 March-April. D. Branchlets brown, spotted, hairless. Ls glaucous below, with hairs on midrib and veins. Catkins up to 3 long. China. (Fig. 97 D.)

DISANTHUS CERCIDIFOLIUS 10. October. D Branchlets spotted, hairless. Ls. roundish ov, 4, palmately veined, entire, hairless, long-stalked. Fls. $\frac{1}{2}$, star-shaped, dark purple, in pairs set back to back at end of short stalk, 5-parted Japan. (Fig 119 G)

DISTYLIUM RACEMOSUM 25. March-April. E. Ls ov, 3, leathery, entire, pointed, glossy, hairless. Fls. reddish purple, stalks covered with rusty scurf; in small erect racemes. Fruit erect, hairy, 2-horned Japan (Fig. 119 H)

FORTUNEARIA SINENSIS. 25. May. D. Branchlets and l-stalks densely covered with star-shaped hairs Ls. obov., 6, rounded or straight base, abruptly pointed, margins undulating and minutely toothed, short-stalked. Fls. small and inconspicuous, K5, C5, A5, in catkin-like terminal racemes developing in autumn. Fruit $\frac{1}{2}$, a brown capsule containing two glossy dark brown seeds. China.

FOTHERGILLA. Ls. obov., broadly ov., margins toothed at outer end or wavy. Fls. crowded in erect brush-like heads, without petals but with long conspicuous stamens.

F. alnifolia (*F. Gardenii*). 3. April-May. D. Ls. 2, coarsely toothed at outer

FOTHERGILLA—*continued*

end, heart-shaped base, glaucous and downy below Fl-heads up to $1\frac{1}{2}$ long South-east United States. (Fig 97 F)

F. major 8 May D. Ls 4, with a few undulating teeth or entire, glaucous and downy below. Fl-heads up to 2 long. South United States (Fig 97 G)

F. monticola 6 May D. Ls 4, green and nearly hairless below, remotely toothed Fl-heads up to 2 long Virginia and Carolina

HAMAMELIS. Witch Hazel Ls. ov., obov, unequal-sided at base, distantly toothed, prominently straight-veined, star-shaped hairs on both sides, short-stalked Fls yellow, in small axillary clusters, petals strap-shaped, yellow, K (4), C₄, A₄

H. japonica 12 February D Ls $3\frac{1}{2}$, base slightly heart-shaped, downy below at first, becoming nearly hairless and green. Petals $\frac{3}{4}$, golden yellow, very crumpled Japan. (Fig. 97 J)

Variety *arborea* 15 Ls. larger and firmer Fls deeper yellow, sepals purple inside

Variety *Zuccarimana* Ls dark green above, tawny down on midrib below. Fls. pale yellow

H. mollis. 12 January D Branchlets zigzagged Ls 5, deeply heart-shaped base, grey- or tawny-felted below. Petals $\frac{1}{2}$, yellow and red China (Fig 97 H.)

H. vernalis. 6 January–March D Ls 4, straight or tapering base, green below. Petals $\frac{1}{2}$, yellow and red U.S.A. (Fig 97 K)

H. virginiana. 20. September–November. D. Branchlets crooked. Ls. 5, unevenly and coarsely round-toothed, slightly heart-shaped base. Petals $\frac{3}{4}$, bright yellow East North America. (Fig. 97 L)

LIQUIDAMBAR STYRACIFLUA. Sweet Gum. 95. May D Young branchlets corky. Ls alternate, ov., 6, palmately 5-7-lobed, toothed, long-stalked Fls small, unisexual, without petals or sepals, in small terminal heads. East United States. (Fig. 27 C.)

* LOROPETALUM CHINENSE. 6. February–March. E. Branchlets zigzagged, wiry, covered with brown down. Ls. ov., 2, unequal-sided at base, minutely toothed, hairy. Fls. $\frac{3}{4}$, white, petals strap-shaped, K (4), C₄, A₄, \tilde{G} (2). China (Fig. 97 M)

PARROTIA PERSICA. Iron Tree. 40. January–March D Bark flaky (like plane). Ls. ov., 5, with vague undulating teeth at outer end, midrib usually not in centre of blade, star-shaped hairs on both sides, short-stalked, often in two rows. Fls small, in small axillary clusters; no petals, stamens bright red enclosed by rough black bracts Persia. (Fig. 98 B)

PARROTIOPSIS (PARROTIA) JACQUEMONTIANA. 20. May–June D Ls. alternate, ov., or nearly circular, 3, blunt-ended, toothed, star-shaped hairs below, short-stalked, resembling common alder. Fls. greenish yellow, in small heads surrounded by four large whitish bracts up to 2 across Fruit $\frac{1}{2}$, a capsule covered by woolly star-shaped hairs. West Himalaya. (Fig. 97 N.)

SINOWILSONIA HENRYI. 20. May. D. Ls. alternate, broad ov., 6, pointed, heart-shaped or straight base, toothed, star-shaped hairs below Fls. small, greenish yellow, in drooping racemes. Fruit $\frac{1}{2}$, a bristly capsule. West China. (Fig. 98 A.)

SYCOPSIS SINENSIS 20 January–March E Ls ov, 4, with a few teeth or entire, leathery, glossy above, net-veined below Fls small, in small axillary clusters, unisexual, stamens bright yellow or reddish enclosed by brown bracts. China (Fig 98 c)

Family 46 *EUCOMMIACEAE* Ko, Co, A10, G (2)

EUCOMMIA ULMOIDES Chinese Gutta-percha Tree 50 April D Branches with chambered pith Ls alternate, ov, lanc, 8, toothed, long-pointed, strands of rubber appear when l is torn across. Fls inconspicuous, unisexual Fruit $1\frac{1}{2}$, flat, winged, 1-seeded. China. (Fig 98 d)

† Family 47 *MYRTACEAE* K4-5 or (4-5), C4-5, A ∞ , $\bar{G}1-\infty$

* *CALLISTEMON* Bottle-brush Tree Summer E. Ls. opposite or sub-opposite, ov, lanc, entire, pitted with oil glands. Fls with showy red or yellow stamens in cylindrical brush-like spikes (see also *MELALEUCA*), the axis of the spike grows on beyond the fls, and continues to produce leaves (Willis) Fruit a dry capsule Australia (Fig. 74 c)

EUCALYPTUS. Gum Trees Bark smooth, peeling. Ls opposite, ov on young trees; alternate, linear or lanc and drooping on older ones, bluish grey, hairless. Fls. small, pale yellow, in small axillary heads or clusters, stamens numerous and conspicuous.

E. coccifera. 70. October–November E. Branchlets warted. Ls. on young trees abruptly pointed. Fl-clusters 5-7-flowered Tasmania (Fig 119 k)

E. cordata. 70. October–November. E. Branchlets warted. Ls. on young trees warted, base heart-shaped, overlapping Clusters 3-flowered. Tasmania. (Fig. 74 f)

* *E. globulus* Blue Gum 300 October–November. E Branchlets 4-angled. Ls highly aromatic. Australia. (Fig 119 j)

E. Gunnii. Cider Gum. 80. October–November E. Ls. on young trees rounded or notched at outer end Clusters 2-3-flowered; calyx tube funnel-shaped. Tasmania, South Australia. (Fig 74 e.)

* *E. urnigera*. 80. October–November. E. Ls on young trees rounded or notched at outer end where there is also a minute point Clusters 2-3-flowered, calyx tube urn-shaped. Tasmania.

E. verrucosa. Dwarf Gum 20 October–November E. Branchlets 4-angled, slightly warted Ls. on young trees abruptly pointed, with marginal vein, scented when crushed; shortly stalked, stalk wrinkled. Tasmania.

EUGENIA. Ls. opposite, ov., entire, gland-dotted. Fls. white, usually 4-parted, ovary 2-celled, in few-flowered branched clusters or racemes Fruit a berry.

* *E. apiculata* (*Myrtus Luma*) 25 September. E. Branchlets covered with reddish-brown down Ls. 1, abruptly pointed, tapering base, dark dull green above, with well-defined marginal vein. Fls. $\frac{1}{2}$. Berry black. Chile. (Fig. 74 h.)

* *E. myrtifolia*. 25. September. E. Branchlets 4-angled. Ls. ov., lanc, 3, short-stalked. Fls. $\frac{1}{2}$, usually in threes. Orient. (Fig. 74 g.)

* *FEIJOA SELLOWIANA* 25. July E. Young branchlets white-felted Ls opposite, ov, 3, blunt-ended, entire, white-felted below Fls 1, 4-parted, stamens red Fruit 2, an egg-shaped berry. South America (Fig. 74 B)

LEPTOSPERMUM South Sea Myrtle, New Zealand Tea Plant. Branchlets slender, twiggy, hairy, dotted with oil glands Ls. alternate, $\frac{1}{2}$, entire. Fls $\frac{1}{2}$, 5-parted, solitary Fruit round and woody, about size of pea, many-seeded.

* *L pubescens*. 12 May E Ls ov, obov, silky below. Fls white. Australia, Tasmania

* *L scoparium* 12. May. E Ls linear Fls white Australia, New Zealand. (Fig 51 C)

Variety *Nichollu*. Fls red.

* *MELALEUCA* Bottle-brush Tree Like *CALLISTEMON*, but the stamens are in bundles opposite the petals Australia

* *METROSIDEROS* Southern Rata. Summer E Like *CALLISTEMON* and *MELALEUCA*, except that the fls. are not in cylindrical brushes, but in small terminal clusters. New Zealand (Fig. 74 D)

MYRTUS Ls usually opposite (sometimes opposite and alternate on the same plant), ov, lanc., entire, short-stalked Fls white, 4-5-parted, ovary 3-5-celled, solitary in l.-axils. Fruit a berry

M. bullata. 25 E. Ls 1, upper surface raised between veins Fls. $\frac{3}{4}$ Berry blackish red. New Zealand.

M. communis Myrtle. 12. August-September E. Branchlets downy. Ls. ov, lanc., 2, pointed, hairless, dark glossy green above, fragrant when crushed, dotted with oil glands Berry purplish black. Mediterranean region. (Fig. 74 A)

Variety *tarentina*. Tarentum Myrtle. Ls. $\frac{3}{4}$, often alternate. Berry white.

* *M nummularia* $\frac{1}{2}$ E. Prostrate. Young stems reddish, slender, hairy. Ls $\frac{1}{2}$, margins recurved. Fls. $\frac{1}{2}$, short-stalked Berry pink. South America (Fig 74 K)

* *M. obcordata* 15. E. Ls. $\frac{1}{2}$, inversely heart-shaped, notched at apex Fls $\frac{1}{4}$, dull white, slender-stalked Berry dark red or violet. New Zealand. (Fig 74 L)

* *M. Ugni* (*Eugenia Ugni*). Myrtilla. 12 September. E Ls 2, margins recurved Fls. $\frac{1}{2}$, sepals reflexed. Berry black. Chile. (Fig. 74 J.)

Family 48. LYTHRACEAE K (8-12), C4-8, A8-16, G (2-6)

* *LAGERSTROEMIA INDICA* Crape Myrtle 20. July-September D. Young branchlets 4-angled, hairless. Ls. opposite on lower, alternate on upper part of shoot, ov, 3, entire, fringed with fine hairs or nearly hairless. Fls. 2, bright pink, in terminal panicles, petals long-clawed and much curled. Fruit a dry capsule. India and China. (Fig 73 F.)

NESAEAE (*HEIMIA*) *SALICIFOLIA*. 6 July-September. D. Stems erect, leafy, much branched, hairless. Ls. opposite on lower, alternate on upper part of stem,

linear, 2, entire, hairless Fls $\frac{1}{2}$, yellow, solitary in l-axils Tropical America. (Fig 50 G)

Variety *grandiflora*. Fls. 1

* PUNICA GRANATUM Pomegranate 25 July–September. D Ls mostly opposite or sub-opposite, oblong, lanc, 3, entire, blunt-ended, very shortly stalked Fls $1\frac{1}{2}$, red, solitary or in pairs at end of short side shoots. Fruit 3, round, deep yellow or reddish brown, with a thick rind inside which are numerous seeds embedded in reddish yellow pulp Persia, India (Fig 73 G)

Family 49. ONAGRACEAE K (2-4), C₄, A₄-8, \bar{G} (4)

FUCHSIA Ls ov, toothed Fls drooping, with four spreading coloured sepals, four petals directed downwards, and eight long hanging stamens Fruit a juicy 4-sided berry.

* *F. cordifolia*. 6. May–June D Branchlets hairy Ls opposite or in threes, ov., 3, heart-shaped base, hairy, long-stalked. Fls 2, tubular, drooping, calyx tube red, petals green Central America (Fig 55 E)

F. excorticata. 40. June–October. D. Bark light brown, peeling; branchlets hairless Ls. alternate, ov, 4, pointed, minutely and distantly toothed or entire, dark green above, whitish below. Fls. 1, reddish purple. New Zealand (Fig. 98 F.)

* *F. gracilis*. 6. June–October. D. Ls opposite or in threes, narrow, ov., 2, tapering base, slender-stalked. Fls. 1, sepals red, linear lanc; petals ov., purple; on long and very thin stalks Mexico (Fig 55 D.)

F. macrostemma (*F. magellanica*) 12. June–October. D Ls opposite or in threes, ov., 2, distantly toothed, bright green, with a few hairs on midrib and margins. Fls 1, sepals red, petals purple. South America (Fig. 55 C)

F. microphylla. 1. June–October D. Ls $\frac{3}{4}$. Fls. 1, sepals deep pink, petals rosy purple. Mexico.

F. procumbens $\frac{1}{2}$. June–October. D. Ls. nearly circular, $\frac{3}{4}$, heart-shaped at base. Fls $\frac{1}{2}$, erect; sepals yellow, recurved, the tube purplish green; petals none. Fruit $\frac{3}{4}$, egg-shaped, pink. New Zealand.

* ZAUSCHNERIA CALIFORNICA. Californian Fuchsia. $1\frac{1}{2}$. August–September D Ls alternate or opposite, ov, lanc., 2, distantly toothed or entire, pale green, hairy on both sides, stalkless. Fls 1, scarlet, drooping, solitary in l-axils. California. (Fig. 98 E.)

Family 50. PASSIFLORACEAE. K (4-5), C₄-5, A₅, \bar{G} 1

*PASSIFLORA COERULEA. Passion Flower. June–September. $\frac{1}{2}$ E. Climber by tendrils; stems hairless. Ls. alternate, 7, palmately 5-7-lobed, lobes oblong with rounded ends, hairless. Fls 4, sepals and petals blue, corona purple, fragrant, on long slender stalks from l-axils of growing shoots. Fruit $1\frac{1}{2}$, egg-shaped, orange-coloured, containing numerous seeds embedded in pulp. Brazil. (Fig. 29 K.)

Variety *Constance Elliott*. Fls. large, ivory-white.

(*P. racemosa*, with red fls., is catalogued by Messrs. Hillier & Sons, Winchester.)

Family 51. *UMBELLIFERAE* K₅, C₅, A₅, \bar{G} (2)

(Carrot, Parsnip, Hemlock, Celery)

* *BUPLEURUM FRUTICOSUM* 8 July $\frac{1}{2}$ E Ls alternate, oblong, lanc., 3, entire, bluish green, firm, rounded at end with minute point. Fls small, greenish yellow, in terminal umbrella-shaped clusters. Fruit of two round 5-ribbed carpels joined by a Y-shaped stalk Mediterranean region. (Fig 120 A)

Family 52 *ARALIACEAE* K₅, C₅, A₅, \bar{G} (5)

Fls small, white or greenish yellow, in umbrella-shaped terminal clusters or panicles Fruit a berry

ACANTHOPANAX (ELEUTHEROCOCCUS) Ls alternate, palmately lobed, 3-fol or digitate. Stems usually prickly Berry black

(a) *Ls. simple, 5-7-lobed*

A. ricinifolium. 90 D Stems prickly Ls up to 14. China and Japan. (Fig 31 E)

(b) *Ls 3-5-fol*

A. Giraldu. 9. July D. Stems dark green, bristly Lfts. lanc., 2, double-toothed, long-pointed China.

A. Henryi 10. June-July D. Stems bristly and spiny. Lfts ov., obov., 3, finely and evenly toothed, rough above China

A. lasiogyne. 20 July. D Branches grey, arching, wide spreading. Ls 3-fol, long-stalked, lfts ov., 2, toothed or entire, very shortly stalked. Fls white. China. (Fig. 2 A.)

A. leucorrhizum. 8. July D. Hairless. Stems yellowish green, with few prickles or none Lfts lanc. 4, double-toothed, long-pointed. Fls. greenish China.

A. senticosum. 6. July. D Stems yellowish green, without spines but bristly. Lfts. ov., 5, finely toothed. Fls purplish yellow. China

A. sessiliflorum. 10. July-August D. Stems stout, grey, very pithy, few or no prickles. Lfts. ov., 5, middle one largest, unevenly toothed Fls. brown-purple, in tight heads; stamens yellow, protruding China.

A. setchuenense 10. July. D Stems yellow, hairless, prickles few or none, straight Ls. 3-fol ; lfts. ov., 5, finely toothed or entire, glaucous below. China.

A. Simonii. 5 July D. Stems green; spines point downwards. Ls. 5-fol.; lfts. lanc, 6, toothed, hairy. China and Japan. (Fig. 5 L)

ARALIA (DIMORPHANTHUS) Stout upright prickly stems. Ls. alternate, pinnate or 2-3-pinnate, large and spreading. Fls. small, whitish. Berry black.

A. chinensis. Chinese Angelica Tree. 30. August-September. D. Lfts stalkless or nearly so, veins straight and ending in teeth. China. (Fig 21 B.)

Variety *albo-marginata*. Lfts. edged with white.

Variety *aureo-marginata* Lfts. edged with yellow.

Variety *mandschurica*. Lfts. deeply toothed, often lobed, downy on midrib and veins below. (Fig. 21 C.)

ARALIA (DIMORPHANTHUS)—*continued*

* *A. spinosa*. Hercules' Club Devil's Walking Stick 50 August D. Lfts. distinctly stalked, veins curve before reaching margin. South United States. (Fig 21 A)

* *DENDROPANAX JAPONICUM* 12 August E. Branchlets hairless Ls ov, 8, often 3-lobed, dark glossy green, leathery, hairless, long-stalked. Fruit $\frac{1}{2}$, ribbed. Assam, China, and Japan. (Fig 31 F)

ECHINOPANAX HORRIDUS (FATSIA HORRIDA) Devil's Club. 12 June D. Very prickly. Ls. alternate, ov., 9, 5-7-lobed, lobes sharply toothed, prickly on both sides Berry $\frac{1}{4}$, scarlet North-west America, North-east Asia.

FATSIA JAPONICA 15. October. E Stem thick, without spines Ls alternate, 16, palmately 7-9-lobed. Fls white, in large branching panicles Berry black Japan (Fig 27 D)

Variety *variegata*. Ls with white blotches near end of lobes

HEDERA HELIX. Ivy October E Climbs by aerial roots Ls alternate, ov, 4, thick and leathery, 3-5-lobed on sterile shoots, unlobed on flowering shoots, hairless, long-stalked. Fls greenish yellow, in small clusters Berry black. Europe (including Britain), Asia (Figs 29 G and 120 B)

Numerous varieties in cultivation.

NOTHOPANAX ARBOREUM 25 E Stems hairless, without spines or prickles Ls. digitate, 3-7-fol, lfts. ov., 3, coarsely and bluntly toothed, stalked. Fls. greenish brown. Berry black. New Zealand. (Fig. 5 J)

PSEUDOPANAX FEROX. 20. D Ls in young plants alternate, linear, 18, deflexed, leathery tapering base, coarsely and unevenly toothed, teeth large, hooked and almost spiny; stalk short and stout. Ls in older plants linear, obov, 6, entire or vaguely toothed at outer end Berry $\frac{1}{2}$, broadly oblong. New Zealand

Family 53 CORNACEAE. K4-10, C4-10, A4-20, \bar{G} (1-2)

ALANGIUM (MARLEA). Ls. alternate, 8, palmately lobed, lobes entire, downy, long-stalked Fls 1, white; petals linear, forming a tube; in small branched axillary clusters. Fruit $\frac{1}{4}$, egg-shaped, thin-walled.

A. chinense (*Marlea begonifolia*). 20 March-June. D L.-stalk 1. Stamens as many as petals. India and China. (Fig 29 F)

A. platanifolium 6. June-July. D. L.-stalks up to 3 Stamens twenty or more. China.

AUCUBA JAPONICA. Spotted Laurel 10. April. E Branchlets green, stout. Ls. opposite, ov., lanc., 8, leathery, glossy green on both sides, hairless, coarsely toothed in outer half, spotted with yellow in female plants. Fls. $\frac{1}{2}$, in terminal panicles; petals purplish, 4-parted. Fruit a red berry. Japan. (Fig 60 B.)

CORNUS. Cornel, Dogwood. Ls. opposite, entire, pointed, lateral veins evenly spaced and converging towards apex in a somewhat concentric arrangement, smaller veins barely visible. Fls. 4-parted, in terminal branched clusters or heads. Fruit a berry.

(a) *Fls. arising from large bracts*

* *C. capitata* (*Benthamia fragifera*) Benthams' Cornel. 40. June-July. D. Ls. ov., lanc., 5, leathery, tapered at both ends, greyish green and downy.

CORNUS—continued

- Fls. 4-6-bracted, bracts obov., 2, sulphur yellow Fruit 1, crimson, fleshy.
North India and China (Fig. 75 G)
- C florida* (*Benthamia florida*) Flowering Dogwood. 20 May D. Ls ov., 6, dark green above, pale and downy below. Fls 4-bracted, bracts obov., 2, notched at apex, white East United States. (Fig 75 C)
- C Kousa* (*Benthamia japonica*) 20. May. D. L margins wavy. Fls 4-bracted, bracts lanc, $1\frac{1}{2}$, long-pointed, creamy white. Berry pink. Japan (Fig 75 D)
- C Mas* Cornel, Cornelian Cherry 25 February D. Ls ov, $2\frac{1}{2}$, long-pointed, 3-5 pairs veins. Fls yellow, appearing before ls, 4-bracted, bracts small, yellowish, boat-shaped. Berry red. Europe. (Fig 75 B)
- C Nuttallii* 50 May D Ls ov, obov, 5, 5-6 pairs veins. Fls 4-8-bracted; bracts 3, pointed, pinkish white Berry red or orange West North America (Fig 75 E)

(b) *Fls without bracts*

- C alba* 10 June D Branchlets bright red in autumn. Ls. ov, 4, dark green above, glaucous white below, six pairs veins. Fls yellowish white. Berry whitish or tinted with blue. North Asia (Fig 75 F)
- Many variegated forms in cultivation, e.g. varieties *sibirica* and *Spaethii*.
- C. macrophylla*. 50 July-August. D Ls. ov, 7, dark green above, glaucous below, long-pointed, 6-8 pairs veins Fls yellowish white, in terminal panicles Berry bluish black. Himalaya to Japan.
- C paucinervis* 8. July-August $\frac{1}{2}$ E. Branchlets 4-angled, reddish brown. Ls lanc., 4, tapering base, dark green above, hairs on both sides, 2-4 pairs veins. Fls. yellowish white Berry black. China.
- C. sanguinea* Common Dogwood. 12. June D Ls ov., 3, with scattered hairs on both sides, 3-4 pairs veins. Fls. dull white Berry black Europe (including Britain) (Fig 75 A.)

COROKIA Ls alternate or in clusters, entire or lobed, white-felted below. Fls $\frac{1}{2}$, yellow, star-shaped, 5-parted Fruit $\frac{1}{4}$, a red or orange-coloured berry.

- * *C buddleioides*. 8. May. E. Branchlets slender, white-felted Ls lanc., 5, long-pointed, bright green above, short-stalked. Fls in panicles up to 2 long Fruit blackish red. New Zealand. (Fig. 120 E)
- * *C. Cotoneaster*. 8. May. E Branchlets wiry and interlaced, white-felted when young, afterwards dark brown. Ls. ov., $\frac{3}{4}$, dark green above. Fls. solitary or in small clusters in 1-axils Berry red. New Zealand. (Fig. 120 C)
- * *C. macrocarpa* 20. June-July. E. Branchlets stiffer and stouter than in the other species. Ls. lanc., 4, blunt-ended. Fls in axillary racemes up to $1\frac{1}{2}$ long. Berry red. New Zealand (Fig. 120 D.)
- * *C. virgata*. 15. May. E. Branchlets slightly zigzagged, not interlaced. Ls. obov, oblanc, $1\frac{1}{2}$ Fls. solitary in 1-axils. Berry orange-yellow. New Zealand. (Fig 120 F)

DAVIDIA. Bract Tree, Chinese Dove Tree. Ls. alternate or in clusters, ov, 6, heart-shaped base, bright green, slender-pointed, evenly and coarsely toothed,

DAVIDIA—*continued*

parallel-veined, long-stalked. Fls. small, in long-stalked rounded heads, each head enclosed by two large creamy white bracts of unequal size. Fruit $1\frac{1}{2}$, pear-shaped, green with purplish bloom, 1-seeded (Fig 98 J)

D. involucrata. 50. May. D. Ls grey-felted below. China.

D. Vilmoriniana. 50. May. D. Ls hairless below. West China

GARRYA ELLIPTICA. 15. February E. Ls opposite, ov., 3, entire, margins wavy, dark green above, downy below, apex ending in short abrupt tip. Fls. small, unisexual, enclosed in silvery grey cup-shaped bracts on long drooping catkins which hang on the plant through winter. Fruit juicy, 2-seeded. California (Fig. 76 A)

GRISELINIA LITTORALIS. 25. May–June E. Ls alternate, ov., 3, entire, leathery, glossy, yellowish green, hairless, blunt-ended, often unequal-sided at base. Fls. small, unisexual, yellowish green, in small axillary racemes or panicles. Fruit $\frac{1}{4}$, oblong, green. New Zealand. (Fig. 120 G)

HELWINGIA JAPONICA (H. RUSCIFLORA) 4. May. D. Ls alternate, ov., 3, tapering at both ends, finely toothed, hairless. Fls. very small, unisexual, in middle of l. Fruit $\frac{1}{4}$, round. Japan (Fig 98 G)

NYSSA SYLVATICA. Tupelo Tree. 100. June. D. Branches slender, spreading or drooping. Ls. alternate, ov., 6, entire, hairless or nearly so, tapering base, stalk slender and reddish. Fls. minute, unisexual. Fruit a blue-black berry, $\frac{1}{2}$, 1-seeded. East North America. (Fig 120 H.)

SUB-CLASS II GAMOPETALAE

Petals and sepals both present as a rule (sometimes one or both absent); petals, when present, are joined together (cannot be pulled off one by one), stamens usually inserted on the corolla, calyx usually persistent in fruit

Family 54 CAPRIFOLIACEAE. K (5), C (5), A₄-5, \tilde{G} (2-5)

Ls opposite, usually without stipules

ABELIA. Stems usually slender and arching. Ls opposite or in threes, short-stalked. Fls. white or pink, tubular or funnel-shaped, solitary or in small clusters in terminal l.-axils, sepals persistent, stamens four. Fruit dry, 1-celled, topped by persistent sepals.

(a) *Sepals two*

A. Engleriana. 4. June–July. D. Ls ov., lanc., 1, tapered at both ends, entire, hairy. Fls. $\frac{1}{2}$, pink, funnel-shaped, in pairs at end of short side twigs. China (Fig. 71 A)

A. Schumannii. 8. August–September. D. Ls ov., 1, blunt-ended, few or no teeth, margins hairy. Fls. 1, pink, solitary in l.-axils. China. (Fig. 62 A.)

A. uniflora. 6. June–July. D. Ls ov., 2, long-pointed, toothed, downy on midrib below. Fls. 1, white or pinkish with orange markings in throat, solitary or in pairs in l.-axils. China.

ABELIA—continued

(b) *Sepals two to five*

A. grandiflora 6. July–October. D Ls. ov., 2, dark green and glossy above, paler below with white hairs at base of midrib, toothed. Fls $\frac{3}{4}$, white or pinkish, funnel-shaped, throat hairy, solitary or in small axillary or terminal clusters. Hybrid. (Fig. 62 B)

(c) *Sepals five*

A. chinensis 4. July–August D. Stems reddish, downy Ls. ov., $1\frac{1}{2}$, toothed, white hairs at base of midrib below. Fls $\frac{1}{2}$, white, fragrant, stamens protruding. China (Fig. 62 c.)

* *A. floribunda* 4. June E Stems reddish, downy Ls. ov., $1\frac{1}{2}$, toothed, firm, glossy on both sides, hairless except on margins. Fls. $1\frac{1}{2}$, pink, tubular, drooping Mexico

* *A. spathulata* 4 May. D Ls. ov., lanc, 2, unevenly toothed, hairy, margins red when young Fls. 1, funnel-shaped, white with yellow in throat, in pairs at end of short side shoots. Japan.

A. triflora. 12. June D. Stems erect, bark corrugated. Ls. ov., lanc, 3, mostly entire, but lowest ones toothed or lobed Fls $\frac{1}{2}$, white with pinkish tinge, in erect clusters at end of short twigs; sepals linear, feathery. Himalaya. (Fig. 71 B)

DIERVILLA. Stems with solid pith. Ls. opposite, ov., lanc., long-pointed, evenly toothed, very shortly stalked. Fls. red, white, pink, or yellow, funnel-shaped, 5-parted, usually in axillary clusters Fruit dry, splitting into two.

(a) *Fls. yellow*

D. sessilifolia. 3 July D Stems 4-angled Ls 7, heart-shaped or rounded at base, stalkless. Fls $\frac{1}{2}$, crowded in terminal clusters. U.S.A.

(b) *Fls. deep red*

D. (Weigela) floribunda 8 May–June. D. Stems slender, hairy. Ls. 4, tapering base, hairy. Fls. 1, stalkless, sepals linear. Japan. (Fig. 59 H)
Various garden forms, e.g. Eva Rathke, Lavallei, Loweri, etc.

(c) *Fls. pink or white*

D. (Weigela) florida 7 May–June D. Stems arching, hairy. Ls. 4, hairy on midrib below. Fls. 1, deep pink outside, white inside; sepals lanc. China.

Variety *candida*. Fls. white.

Variety *variegata*. Ls. edged with yellow.

D. (Weigela) grandiflora. 10. May–June. D. Stems hairless. Ls. 5, stalk bristly. Fls. 1, pink changing to carmine, stalked; sepals linear. Japan.

D. (Weigela) japonica. 8 June. D. Ls. densely downy below. Fls. pink, changing to carmine, stalked; sepals linear. Japan.

Variety *hortensis*. Fls. white Ls. white-felted below.

Variety *Looymansu aurea*. Ls. yellow.

DIPELTA. Ls. opposite, short-stalked, entire or vaguely toothed. Fls. pink with yellow in throat; stalk hairy, with four unequal bracts, the two larger ones hiding the ovary and becoming wings to the fruit; solitary or in few-flowered clusters, K (5), C (5), A4.

DIPELTA—continued

D. floribunda 15. May D Bark peeling. Ls ov., lanc, 4, entire, long-pointed, downy on both sides and at margins, rounded or tapering base. Fls 1, funnel-shaped. China. (Fig 61 Q)

D. ventricosa 15. May D Ls often with a few teeth Fls bell- or pitcher-shaped China. (Fig. 61 P)

KOLKWITZIA AMABILIS Wilson's Beauty Bush 7 May. D Stems bristly or rough. Ls. opposite, ov, 2, distantly toothed, deeply veined, hairy, stalk short and bristly. Fls $\frac{1}{2}$, pink with yellow in throat, funnel-shaped, in pairs in small terminal branched clusters, K (5), C (5), A4 Fruit $\frac{1}{4}$, egg-shaped, bristly, sepals persistent. Hupeh province of China. (Fig 59 D.)

LEYCESTERIA Flowering Nutmeg Stems hollow, thin-walled. Ls. opposite, ov., 6, long-pointed, vaguely toothed or entire, short-stalked Fls. $\frac{3}{4}$, funnel-shaped, stalkless, in several whorls, each whorl enclosed by l.-like bracts, K (5), C (5), A5. Fruit a berry, like a small gooseberry

* *L. crocothysos* 8. April D. Stem with pairs of large kidney-shaped stipules Fls yellow East Himalaya

L. formosa 8. June–September D. Fls purplish with claret-coloured bracts. Himalaya. (Fig 59 G)

LINNAEA BOREALIS Twin Flower. $\frac{1}{4}$. July–August E. Creeping plant with woody base. Ls. opposite, ov, $\frac{1}{2}$, rounded and coarsely toothed at apex, tapering base, hairy. Fls. $\frac{1}{2}$, pink or white, nodding in pairs at top of slender stalk, funnel-shaped, K (5), C (5), A4. Fruit yellow, dry, egg-shaped, 1-seeded. North Hemisphere (including Britain). (Fig 56 J.)

LONICERA. Honeysuckle. Ls opposite or in threes, short-stalked or stalkless, entire. Fls stalked, in pairs in l.-axils, or stalkless, in terminal whorls, 5-parted. Fruit a berry

(a) Climbers

L. Caprifolium Perfoliate Woodbine 20. May–June. D. Stems hairless. Ls. ov, 4, hairless, blunt-ended, glaucous below, upper pairs united at base. Fls. 2, tubular, 2-lipped, yellowish white, in a terminal whorl in a large leafy cup. Berry orange-coloured. Europe (including Britain), West Asia (Fig. 71 F.)

L. japonica (*L. japonica*, variety *Halliana*, *L. confusa*). 30. June–July. D. or $\frac{1}{2}$ E. Stems hairy. Ls ov, 3, pointed, downy on both sides Fls. 1, white, changing to yellow, tubular, 2-lipped, in pairs in l.-axils. Berry black. Japan. (Fig. 71 H.)

Variety *aureo-reticulata*. Veins yellow, ls. often pinnately lobed.

Variety *flexuosa* (*brachypoda*). Stems purple. Fls. reddish outside.

L. Periclymenum. Common Honeysuckle, Woodbine. 20. June–September. D. Ls. ov., obov., $2\frac{1}{2}$, green above, glaucous below, never united at base. Fls. 2, yellow or red, tubular, 2-lipped, in terminal whorls. Berry red. Europe (including Britain). (Fig. 71 E.)

Variety *belgica*. Dutch Honeysuckle. Stems purple, hairless; ls hairless.

Variety *quercina*. Oak-leaved Woodbine. Ls. lobed.

Variety *serotina*. Late-flowering Honeysuckle. Fls. dark purple outside

LONICERA—continued

- * *L. sempervirens* Trumpet Honeysuckle 20 June–September $\frac{1}{2}$ E Stems hairless, glaucous Ls ov, $2\frac{1}{2}$, bright green above, bluish below, uppermost pairs united. Fls 2, tubular, scentless, orange-scarlet, in terminal whorls Berry red. South United States. (Fig 71 G)
- L. tragophylla* Chinese Woodbine June–July D Stems hairless Ls ov, 4, glaucous and slightly downy below, uppermost pairs united Fls 3, yellow, tubular, 2-lipped, in terminal whorls, not fragrant. Berry red. Hupeh, province of China

(b) Evergreen Shrubs

- L. nitida* 5 April–May E. Stems slender, erect, purplish, hairy. Ls ov., $\frac{1}{4}$, glossy green, hairless Fls. $\frac{1}{4}$, white, in pairs in l-axils Berry blue-purple, transparent. China (Fig 71 J)
- L. pileata*. 2. May E. Stems spreading, purplish, hairy Ls. ov., 1, blunt-ended, glossy green, hairless. Fls $\frac{1}{4}$, yellowish white, in pairs in l.-axils. Berry blue-purple, transparent China. (Fig. 71 K.)

(c) Deciduous shrubs with solid white pith

- L. Albertu*. 4. June Stems slender, hairless, spreading. Ls. linear, 1, blunt-ended, bluish green, hairless. Fls. $\frac{1}{2}$, lilac. Berry purplish red. Turkestan. (Fig. 50 L.)
- L. alpigena*. Cherry Woodbine 8. April–May. Stems erect, hairless. Ls. ov., 4, margins hairy. Fls $\frac{1}{2}$, yellow tinged with red, 2-lipped. Berry $\frac{1}{2}$, red. Alps and Himalaya (Fig. 73 C.)
- L. Ferdinandii*. 10. June. Stems bristly; barren ones with leafy disks at each joint. Ls ov, 4, long-pointed, dull green, hairy. Fls. $\frac{3}{4}$, yellow, 2-lipped. Berry red. China (Fig. 72 J.)
- L. fragrantissima*. 8. December–March. $\frac{1}{2}$ E. Stems hairless. Ls. ov., 2, leathery, ending in bristle-like tip, dark dull green above, glaucous below. Fls. $\frac{1}{2}$, white, very fragrant. Berry red. China (Fig. 72 B.)
- L. Ledebourii*. 9. June. Stems erect, 4-angled, hairless. Ls. ov., 4, hairy. Fls. $\frac{3}{4}$, yellow and red, on long erect stalk, at top of which are two large reddish bracts. Berry black California. (Fig. 72 E.)
- L. Myrtillus*. 4. May. Dense and compact bush. Ls. ov., $\frac{1}{2}$, dark green above, glaucous below, hairless, margins recurved. Fls. $\frac{1}{2}$, pinkish white. Berry orange-red. Himalaya. (Fig. 71 M.)
- L. pyrenaica*. 3. June. Stems erect, hairless. Ls. obov., oblanc, 1, glaucous, hairless. Fls. $\frac{1}{2}$, pink. Berry red. Pyrenees.
- L. rupicola*. 8. May–June. Very dense bush. Stems interlacing, hairless, bark peeling. Ls. in threes, ov., 1, hairy below. Fls. $\frac{1}{2}$, pink. Berry red. Tibet. (Fig. 72 D.)
- L. Standishii*. 8. November–March. $\frac{1}{2}$ E. Bark peeling; stems warted, bristly. Ls lanc., 4, pointed, bristly on midrib and margins. Fls. $\frac{1}{2}$, white, very fragrant. Berry red. China. (Fig 72 A)
- L. syringantha*. 8. May. Stems slender, spreading, hairless. Ls. ov., $\frac{3}{4}$, dull greyish green, hairless. Fls. $\frac{1}{2}$, lilac. Berry red. China. (Fig. 72 G.)
- L. thibetica*. 6. May–June. Stems purplish, hairy, bark peeling. Ls. in threes, lanc., 1, dark green above, white-felted below. Fls $\frac{1}{2}$, lilac. Berry oblong, red. Tibet. (Fig. 71 L.)

LONICERA—continued

L. tomentella 12 June–July. Stems woolly. Ls. ov., oblong, $1\frac{1}{2}$, woolly below. Fls. $\frac{1}{2}$, pinkish white, drooping. Berry blue-black. Himalaya (Fig. 72 c.)

(d) Deciduous shrubs with hollow or brown pith

L. chrysantha. 12. June Stems hairy. Ls. ov., lanc, 4, pointed, hairy. Fls. $\frac{1}{2}$, yellow, corolla conspicuously swollen at base Berry coral-red. Siberia. (Fig. 73 A)

L. deflexicalyx 10. June. Stems often horizontal or drooping, branchlets in opposite rows, purplish, hairy. Ls. ov, 3, pointed, hairy. Fls. $\frac{1}{2}$, yellow, 2-lipped. Berry orange-red. China. (Fig. 73 B)

L. Maackii. 10 May. Stems spreading; branchlets often in two opposite rows Ls. ov., lanc., 3, long-pointed, tapering base, hairy. Fls. $\frac{1}{2}$, white or yellow, 2-lipped, in close row on upper side of stem. Berry red Manchuria. (Fig. 72 F)

L. quinquelocularis 15. June. Stems purplish, hairy Ls. ov., 2, rounded or short-pointed at end, hairy. Fls. $\frac{3}{4}$, white or yellow, 2-lipped Berry white, transparent Himalaya. (Fig. 73 D)

L. tatarica. 10. May. Stems hairless. Ls. ov, green above, glaucous below, hairless. Fls. 1, white or pinkish, 2-lipped. Berry red. Siberia. (Fig. 72 K.)

Variety *rubra*. Fls. rosy red.

L. tricosantha. 8. June. Ls. ov., 2, grey Fls. $\frac{3}{4}$, pale yellow. Berry red. China. (Fig. 71 N.)

L. Xylosteum Fly Honeysuckle. 10. May. Stems hairy Ls. ov, or roundish, $2\frac{1}{2}$, velvety down on both sides; stalk $\frac{1}{4}$, hairy. Fls. $\frac{1}{2}$, yellowish white, 2-lipped, on stalks up to $\frac{1}{2}$. Berry red. Europe (including Britain), North Asia (Fig. 72 H)

SAMBUCUS. Elder. Branchlets stout, pithy, warted. Ls. opposite, pinnate; lfts. ov, 5, toothed. Fls. small, white, 5-parted, in terminal flattish branched clusters. Fruit a berry.

S. canadensis. American Elder. 12. June–July. D. Pith white. Ls. 7-fol. Berry black. North America.

Variety *aurea*. Ls. golden yellow.

Variety *maxima*. Ls. up to 18 long Fl.-clusters up to 18 across

S. nigra. Common Elder. 20. June. D. Pith white; Ls. 5-fol. Berry black. Europe (including Britain). (Figs. 8 F and H.)

S. racemosa. Red-berried Elder. 12. April–May. D. Pith brown. Berry red. Europe and North Asia.

Varieties *laciniata*, *plumosa*, and *plumosa aurea* are forms in which the lfts. are pinnately lobed or dissected, the last named being golden-leaved. (Fig. 8 G.)

SYMPHORICARPUS. Ls. opposite, entire or lobed, short-stalked, often in two opposite rows. Fls. small, white or pink. Fruit a berry.

S. mollis. 1. June–July. D. Low prostrate shrub. Stems hairy. Ls. nearly circular, 1, sometimes shallowly lobed, hairy. Fls. $\frac{1}{4}$, pinkish white,

SYMPHORICARPUS—*continued*

solitary or in few-flowered clusters. Berry $\frac{1}{4}$, white. California. (Fig. 71 D)

S. occidentalis. Wolfberry. 3 June–July. D. Stiff and upright Ls. ov., 2, entire. Fls. pinkish, with protruding style and stamens. Berry $\frac{1}{2}$, white. North America. (Fig. 71 Dd)

Variety *Heyeri*. Ls. thinner and less distinctly veined below (Rehder).

S. orbiculatus (*S. parvifolius*, *S. vulgaris*). Coral Berry. Indian Currant 7. August–September D. Stems thin, hairy. Ls. ov., 1, hairy. Fls. very small, white, in dense clusters or spikes. Berry purplish red. North America (Fig. 71 C)

Variety *variegatus*. Variegated form

S. racemosus (*S. albus*) Snowberry 10. June–July D. Ls. nearly circular, 3, often lobed, hairless. Fls. $\frac{1}{4}$, pink, bell-shaped. Berry $\frac{1}{2}$, white. North America (Fig. 34 J)

VIBURNUM Ls. opposite, simple. Fls. small, white or pinkish, in branched clusters, K (5), C (5), A5, G1 Fruit a berry.

(a) *Ls. palmately lobed*

V. acerifolium. Dockmackie. 6. June–July D. Ls. ov., 4, 3-lobed, rounded or heart-shaped base, scattered hairs above, softly downy with black dots below. Fls. white, $\frac{1}{2}$. Berry red to black. East North America. (Fig. 25 G.)

V. Opulus. Guelder Rose. 15. June. D. Young stems ribbed. Ls. ov., 4, 3-5-lobed, coarsely and unevenly toothed, dark green above, downy below. Fl-cluster 3 across Berry red. Europe (including Britain). (Figs. 25 F and 26 A)

Variety *sterile*. Snowball Tree. Fls. in closely packed round heads. (Fig. 26 B.)

(b) *Ls. 3-nerved, leathery, evergreen*

V. cinnamomifolium 20. June. Ls. ov., 5, nearly entire, hairless. Fls. white, in loose clusters or panicles. Berry blue-black China.

V. Davidn. 2. June. Ls. ov., 6, nearly entire, hairless Fls. white, in stiff clusters. Berry blue. China. (Fig. 65 c.)

(c) *Ls. pinnately nerved, evergreen*

V. Burkwoodii. 5. April. See *V. Carlesii* under (e).

V. coriaceum (*V. cylindricum*) 50. July–September. Branchlets warted, hairless Ls. ov., 8, long-pointed, distantly toothed in outer half, upper surface covered with wax which shows white when l. is folded or rubbed. Fls. white, tubular, stamens lilac-coloured, protruding. Berry black. Himalaya, China. (Fig. 63 B.)

V. Harryanum 8 July–August. Branchlets downy Ls. roundish, 1, entire, hairless, nearly stalkless. Fls. white. Berry black. China. (Fig. 65 F.)

V. Henryi. 10. June–July. Branchlets stiff, hairless. Ls. ov., lanc., 5, finely and distantly toothed, bluish green, hairless. Fls. in stiff pyramidal panicles. Berry red to black. China. (Fig. 63 A.)

V. macrocephalum, variety *sterile* 20. May. Branchlets scurfy. Ls. ov., 4,

VIBURNUM—continued

- toothed, dull green, hairy Fls $1\frac{1}{2}$, white, in large round trusses No fruit China (Fig. 63 c)
- V. odoratissimum* (*V. Awafuki*) 20. August Branchlets warted, hairless. Ls ov, 8, tapering base, entire, glossy green, leathery, hairless Fls. white, in broad pyramidal panicles. Berry red to black China (Fig. 65 B.)
- V. rhytidophyllum* 10. May–June Branchlets covered with bright tawny down. Ls., ov, lanc, 8, entire, wrinkled above, felted or woolly below. Fls yellowish white, in large flattish trusses Berry red to black. China (Fig. 65 D)
- V. Tinus*. Laurustinus. 10 November–May Branchlets hairless or nearly so, sometimes 4-angled. Ls ov, 4, dark glossy green above, margins hairy when young, leaf-stalk hairy. Fls. white Berry black. Mediterranean region (Fig. 65 A)
- V. utile*. 6 May. Branchlets slender Ls. ov., lanc, 3, entire, firm, dark glossy green above, white-felted below, stalk very short. Fls. white, in rounded trusses Berry blue-black. China. (Fig 65 G)

(d) *Ls pinnately nerved, deciduous, lateral veins curve aside before reaching margin*

- V Lentago* Sheepberry 30 May–June. Branchlets reddish, scurfy. Ls. ov., 4, finely and sharply toothed, hairless except for scurf on midrib and veins; stalk winged. Fls creamy white, fragrant, in stalkless clusters. Berry blue-black, bloomy. North America. (Fig. 64 C)
- V. macrocephalum*. See under (c).
- V. nudum*. Withe Rod. 10. May–June. Branchlets slightly scurfy. Ls ov., 4, minutely and unevenly toothed, dark glossy green above, scurfy or smooth below; l.-stalk slightly winged. Fls. yellowish white in stalked clusters. Berry blue-black East North America. (Fig. 64 D.)
- V. prunifolium*. Black Haw. 30 June Branchlets reddish, hairless Ls ov., $3\frac{1}{2}$, minutely toothed, hairless; stalk reddish. Fls. white in stalkless clusters. Berry dark blue North America (Fig. 64 E)
- V. rufidulum*. Southern Black Haw. 40. June. Branchlets rigid, covered with rust-coloured down. Ls. ov, 3, stiff and leathery, dark glossy green above, rusty below. Fls. white. Berry blue. South United States.

(e) *Ls. pinnately nerved, deciduous, lateral veins reach margin*

(i) L.-buds without scales.

- V. bitchuiense*. 10 April–May. Branchlets hairy. Ls. ov., 3, toothed, hairy, stout-stalked. Fls. $\frac{1}{2}$, pink or white, slender-tubed, fragrant. Berry black. Japan. (Fig. 63 E.)
- V. buddleiifolium*. 6. May–June. Branchlets densely downy. Ls. ov., lanc., 5, pointed, shallowly toothed, rounded or heart-shaped base, dark green and wrinkled above, white-felted or woolly below. Fls. white, funnel-shaped. Berry black. China. (Fig. 63 F.)
- V. Carlesii*. 5. April. Branchlets densely downy. Ls. broadly ov., 3, unevenly toothed, hairy, sometimes unevenly lobed, dull green above, greyish below. Fls. $\frac{1}{2}$, pink or white, slender-tubed, fragrant, in terminal rounded

VIBURNUM—continued

- clusters. Berry black. Corea (Fig 63 G.) (Very similar is *V. Burkwoodu*, E, a cross between this and *V. utile*.)
- V. cotinifolium* 12. May. Branchlets grey-felted. Ls. ov., 5, finely toothed or entire, dark green above, grey-felted below. Fls. white or pink, widely funnel-shaped. Berry black. Himalaya (Fig 65 E.)
- V. Lantana* Wayfaring Tree 15. May–June. Branchlets stout and stiff, densely downy or pale-felted. Ls. ov. or roundish, 5, pointed, toothed, hairy, heart-shaped base. Fls. white in flattish-topped clusters. Berry red to black. Europe (including Britain), North Asia, North Africa. (Fig 64 B.)
- V. lantanoides* (*V. almifolium*) American Wayfaring Tree, Hobble Bush. 10. May–June. Branchlets scurfy. Ls. ov., 8, short-pointed, heart-shaped base, unevenly toothed, dark green above, scurfy-downy below. Fls. white in stalkless clusters, marginal fls. $\frac{3}{4}$, sterile. Berry red to dark purple. East North America.

(ii) L-buds scaly

- V. betulifolium* 12. June–July. Branchlets hairless. Ls. ov., 4, coarsely toothed at outer end. Fl.-clusters large and loose. Berry red. China. (Fig 63 D.)
- V. dilatatum* 10. June. Young branchlets very 'downy'. Ls. roundish ov., obov., 5, pointed, distantly toothed, hairy. Fls. $\frac{1}{2}$, white. Berry $\frac{1}{2}$, red. China and Japan.
- V. foetens* 10. January–March. Branchlets hairless. Ls. ov., 4, pointed, toothed, parallel-veined, hairless except in vein-axils below, emit strong disagreeable odour when rubbed. Fls. $\frac{1}{2}$, white, tubular, fragrant. Berry black, edible. Himalaya.
- V. fragrans* 10. November–April. Like *V. foetens*, but ls. not offensive when rubbed and fl.-clusters stiffer and more fragrant. Berry red, edible. China (Fig. 64 A.)
- According to Bean there is a form in cultivation with 'bronzy young leaves and shoots, and flowers that are pink in bud.'
- V. hupehense* 6. June. Branchlets downy. Ls. roundish, 3, long-pointed, coarsely toothed, heart-shaped or straight base, hairy, stalk grooved. Berry red. China.
- V. lobophyllum* 15. June–July. Branchlets dark reddish brown, nearly hairless. Ls. roundish ov., 4, rounded or heart-shaped base, shallowly and somewhat coarsely toothed, dark green above, hairy below, 5–6 pairs veins. Fls. white in long-stalked flattish clusters. Berry $\frac{1}{2}$, bright red. China. (Fig. 64 J.)
- V. molle* 12. May–June. Branchlets hairless; older bark peeling. Ls. roundish, 5, heart-shaped base, coarsely toothed, stipulate. Fls. white in long-stalked clusters. Berry blue, flattened. North America (Fig. 64 F.)
- V. Sieboldii* 10. May–June. Branches stiff and spreading. Ls. obov., 5, parallel-veined, coarsely toothed, dark glossy green above. Fls. $\frac{1}{2}$, creamy white in long-stalked rounded clusters or panicles. Berry $\frac{1}{2}$, egg-shaped, pink to blue-black. Japan.
- V. theiferum* 12. May–June. Branchlets hairless, grey. Ls. ov., lanc., 6, long-pointed, distantly and sharply toothed, parallel-veined. Fls. white. Berry red. China.

VIBURNUM—continued

V. tomentosum. 10 June Branchlets horizontal, downy Ls. ov, 4, toothed, hairy. Fls. white in flat-topped clusters, outer ones large, with unequal petals. Berry red to black. Japan. (Fig. 64 G)

Variety *plcatum* (*V. plcatum*) Japanese Snowball Tree. Fls 1, in erect round trusses.

V. venosum (*V. pubescens*) 12 June–July. Branchlets downy Ls roundish, 4, coarsely toothed, rounded or heart-shaped base, hairy, slender-stalked. Fls white Berry blue. North America (Fig 64 H)

Variety *affine* (*hypomalacum*). Ls densely downy below, short-stalked

V. Wrightii 10. May. Branches erect Ls ov, obov., 5, distantly toothed, point long and abrupt, bright green above, 6–10 pairs parallel veins. Fls. white. Berry red Japan.



Family 55. RUBIACEAE K4-5, C (4-5), A4-5, G (2)

Ls opposite or whorled, entire, often with triangular stipules on stem between l-stalks.

CEPHALANTHUS OCCIDENTALIS Button Bush. 6 August – September. D. Stems olive-green, shining, hairless. Ls. in threes, ov., 5, tapering at both ends, glossy, hairless Fls. small, white, in axillary long-stalked round heads Fruit dry. North America (Fig. 67 O)

COPROSMA. Ls. opposite. Fls inconspicuous Fruit a berry.

C. acerosa $\frac{1}{4}$ E Stems prostrate, wiry, interlacing. Ls. linear, $\frac{3}{4}$, dark green, hairless. Berry pale transparent blue New Zealand. (Fig 50 E.)

* *C. foetidissima*. 15. E Ls. ov., lanc, 2, slender-stalked, emits very disagreeable smell when bruised Berry red or yellowish red, transparent. New Zealand. (Fig 67 N.)

* *C. grandifolia* 15. April–May E. Ls. obov, 9, dull green, slender-stalked Berry $\frac{1}{4}$, orange-red. New Zealand.

* *C. lucida* 15. E. Ls. obov., 5, leathery and glossy, short-stalked. Berry oblong or pear-shaped, reddish orange New Zealand. (Fig. 67 M.)

C. Petriei $\frac{1}{4}$. E. Stems prostrate. Ls. linear, oblong, $\frac{1}{4}$, hairy. Berry purple. New Zealand (Fig. 48 L.)

C. rigida. 15. April. E. Stiff and erect. Ls. obov., oblanc., $\frac{3}{4}$, stiff and rather leathery, hairless. Berry $\frac{1}{4}$, oblong or pear-shaped, yellow. New Zealand.

EMMENOPTERYS HENRYI 80. June–July. D. Branchlets hairless. Ls. opposite, ov., 9, tapering base, entire, rather fleshy, with a velvety sheen; stalk reddish. Fls. 1, white, funnel-shaped, in large terminal panicles; one lobe of calyx develops into a large white bract. Fruit 1, spindle-shaped, ribbed. China. (Fig. 67 G.)

LEPTODERMIS. Ls. opposite, entire, with disagreeable smell when crushed. Fls. white or purple, 5-parted, in axillary clusters. Fruit dry, splitting into five.

L. lanceolata. 3. July–October. D. Ls. ov., lanc., 3. Fls $\frac{1}{2}$, white, fading to pale yellow, the clusters forming large terminal panicles. Himalaya. (Fig. 67 J.)

L. oblonga. 4. July–September. D. Ls. lanc, 1, rough above. Fls. $\frac{3}{4}$, purple, tubular. China. (Fig. 67 L.)

LEPTODERMIS—*continued*

L. pilosa. 10. July–September D. Ls ov, 1, grey-green, hairy Fls $\frac{1}{2}$, lavender-coloured. China. (Fig 67 K)

L. Purdomu. 5 August–September D Stems long, slender, wiry Ls linear, $\frac{1}{2}$, in clusters at joints, hairless Fls $\frac{1}{2}$, pink, tubular China (Fig 50 K)

LUCULIA Branchlets dotted Ls. opposite, ov, lanc, 6, with nine or more pairs veins Fls $1\frac{1}{2}$, funnel-shaped, fragrant, in terminal branched clusters Fruit a capsule with numerous winged seeds

* *L. gratissima*. 12 August–September D. Branchlets downy Fls pink Himalaya

* *L. Pinceana*. 12. June–September. D. Branchlets hairless. Fls white. Himalaya

MITCHELLA REPENS Partridge Berry. Prostrate June–July E Ls. opposite, ov, $\frac{1}{2}$, hairless Fls. $\frac{1}{2}$, white or tinged with purple, funnel-shaped, 4-parted, in stalked pairs. Fruit $\frac{1}{4}$, a red berry North America (Fig 67 c.)

PAEDERIA CHINENSIS (P. TOMENTOSA). 18. June–September D Climber. Ls opposite, ov., lanc, 4, downy below Fls $\frac{1}{2}$, tubular, white, with purple throat, in axillary and terminal branched clusters. China

✓
Family 56 COMPOSITAE. K (5), C (5), A (5), G₁
(Daisy, Dandelion, Groundsel, Thistle)

Fls in composite heads, each head having the appearance of a single fl.; sepals reduced to hairs or bristles (pappus); what appear to be sepals are really bracts.

(I) FL.-HEADS USUALLY WITH RAY FLORETS

(DAISY SECTION)

* APLOPAPPUS (DIPLOPAPPUS) ERICOIDES. 5 August. E. Stems erect. Ls linear, $\frac{1}{2}$, in clusters at each joint. Fls. $\frac{1}{2}$, yellow, in long-stalked terminal branched clusters; ray florets five. California. (Fig. 49 N.)

* GRINDELIA SPECIOSA. 3. May–October. E. Young stems sticky and very leafy. Ls alternate, linear oblong, 4, tapering base, coarsely toothed, grey-green, gummy; stalkless or nearly so. Fls. 3, yellow, solitary, long-stalked. South America.

* HELICHRYSUM (OZOTHAMNUS) ROSMARINIFOLIUM. 9. July–September. E. Young stems ribbed, clammy. Ls. alternate, linear, 1, dark green and clammy above, pale below, margins recurved. Fls. small, white, in rounded branched clusters at end of short side shoots. Victoria and Tasmania. (Fig. 51 N.)

MICROGLOSSA (ASTER, AMPHIRAPHIS) ALBESCENS. 5. July. D. Stems pithy, grey and downy. Ls. alternate, lanc., 5, tapered at both ends, pointed, minutely and distantly toothed, dark green above, grey down below. Fls. $\frac{1}{2}$, bluish purple with yellow centre, in terminal branched clusters. Himalaya. (Fig. 98 H)

* MUTISIA DECURRENS 10. Summer. E. Climbing by tendrils. Ls. lanc., 5, entire, ending in forked tendril, base continued down stem as a pair of narrow wings. Fls 4, red or orange with yellow centre, solitary at end of shoot, long-stalked Chile. (Fig 120 K.)

(*M. ilicifolia* has leathery ls. with spiny teeth; *M. Clematis* has pinnate ls.)

OLEARIA New Zealand Daisy Bush Evergreen shrubs with stiff leathery ls, usually green above and white, grey, or silvery below. Fls small, white or purplish, in branched clusters.

(a) *Ls opposite or in opposite clusters*

- O odorata*. 10. August. Branchlets slender, cylindrical, wiry Ls linear, 1, blunt-ended, green above, silvery below Fls $\frac{1}{4}$, greyish brown, fragrant New Zealand. (Fig. 53 F)
- * *O Solandri* 10. May-June Branchlets angled, yellowish, downy. Ls linear, obov, $\frac{1}{4}$, yellow-felted below. Fls $\frac{1}{4}$, solitary from centre of 1-cluster New Zealand (Fig 49 L)
- * *O. Traversii*. 15 June. Branchlets 4-angled, silver-felted Ls ov., 2, entire, apex ending in minute tip, bright dark green above, silver-felted below. Fls. dull grey, without ray florets. New Zealand. (Fig 70 D)
- * *O virgata*. 10. May-June. Branchlets slender, wiry, 4-angled, hairless. Ls linear, oblanc, $\frac{3}{4}$, white-felted below, stalkless Fls yellowish white, in opposite clusters, three to six ray florets New Zealand (Fig. 53 E.)
- Variety *lineata* Branches more pendulous L-clusters further apart, ls narrower Eight to fourteen ray florets (Bean)

(b) *Ls. alternate, toothed*

- * *O. argophylla*. 30 May-June Branchlets silver-felted Ls ov., lanc, 6, shallowly and distantly toothed, silver-felted below Fls white, three to six ray florets. Australia and Tasmania (Fig. 99 A.)
- * *O chathamica* 6. May-June. Ls. lanc, 5, evenly and bluntly toothed, white-felted below, prominent veins run lengthwise besides midrib. Fls. $1\frac{1}{2}$, purple. Chatham Islands. (Fig. 99 B)
- * *O Colensoi*. 10. July Ls ov, lanc, 6, very leathery, glossy green above, white wool below, stout-stalked, veins netted and prominent below. Fls. 1, brownish purple, in racemes up to 6 long New Zealand (Fig. 99 C.)
- * *O. erubescens*. 5. May-June. Branchlets brown, downy Ls. ov., lanc., very variable in size, $\frac{1}{2}$ to 2, conspicuously toothed, glossy green above. brown-felted below. Fls. 1, white, in cylindrical panicles up to 18 long. Australia. (Figs. 99 H-K)
- Variety *ilicifolia* Ls. large.
- * *O. Gunniana* (*O. stellulata*). 10 May. Branchlets white-felted. Ls. lanc., $1\frac{1}{2}$, rounded at end, coarsely round-toothed, white- or brown-felted below. Fls. 1, white, in erect open-branched clusters; ten to sixteen ray florets. New Zealand. (Fig. 99 L)
- * *O. macrodonta*. 20. June-July. Bark peeling; branchlets angled, downy. Ls. ov., 5, leathery, coarsely toothed, dark glossy green above, silver-felted below. Fls. $\frac{1}{2}$, white with reddish centre, ten or more ray florets. New Zealand. (Fig. 99 D.)
- * *O. myrsinoides*. 5. May-June. Branchlets angled, silvery. Ls. ov., $\frac{1}{2}$, blunt-ended, silvery and scaly below. Fls. white, in cylindrical panicles up to 12 long. New Zealand.
- * *O. nitida*. 12. May-June. Branchlets grooved, brown-felted. Ls. ov., 3, distantly toothed, dark glossy green above, silver-felted below, margins often wavy. Fls. $\frac{1}{2}$, white, fifteen to twenty ray florets. New Zealand. (Fig. 99 E.)

OLEARIA—*continued*

- * *O semidentata* 12. May-June Branchlets slender, white-felted. Ls. linear, lanc, 3, toothed at outer end, dark green and wrinkled above, white wool below. Fls 2, purple, solitary Chatham Islands (Fig 99 F.)
- * *O speciosa* 4 June. Ls ov, lanc, 4, dark glossy green and wrinkled above, brown-felted below, coarsely and unevenly toothed. Fls. 1, white, in loose branched clusters New Zealand. (Fig. 99 G)

(c) *Ls alternate, entire*

- * *O albida* 20 July Branchlets grooved, brown-felted. Ls ov, 4, blunt-ended, dark green above, white-felted below. Fls. $\frac{1}{2}$, white, one to three ray florets New Zealand (Fig. 120 O)
- * *O avicennaeifolia* 20 August-September Branchlets ribbed, white-felted. Ls ov, lanc, 4, greyish green above, white- or yellow-felted below, stalk grooved Fls $\frac{1}{2}$, white, two to three ray florets. New Zealand (Fig 120 L)
- * *O floribunda* 6 June E A heath-like plant with minute ls. in alternate clusters Fls $\frac{1}{2}$, white, in leafy racemes, forming large panicles, three to four ray florets. Australia (Fig 49 O)
- * *O Forsteri* 20. October Branchlets ribbed, dark brown, scurfy. Ls. ov., 3, rounded or heart-shaped base, margins wavy, glossy green above, white-felted below, stalk grooved Fls $\frac{1}{2}$, dull white, in small axillary panicles, each fl. consists of a solitary tubular floret. New Zealand. (Fig 120 M)
- * *O furfuracea* 20 Ls. ov, 4, very leathery, sometimes with a few teeth, glossy green above, silver-felted below. Fls $\frac{1}{2}$, white, in axillary branched clusters, two to five ray florets. New Zealand. (Fig. 120 Q)
- O. Haastii* 9 July-August. Branchlets downy. Ls ov, 1, rounded at end, glossy green above, white- or tawny-felted below, very shortly stalked. Fls $\frac{1}{2}$, white, in branched clusters at end of twigs. New Zealand (Fig 120 R.)
- * *O lineata* 10. Stems slender, often drooping. Ls. linear, 2, mostly in alternate clusters, white-felted below, margins recurved. Fls small, in small axillary clusters, 8-14 ray florets New Zealand. (Fig. 53 G.)
- * *O. nummularifolia* 10. July. Branchlets slightly downy. Ls. ov., $\frac{1}{2}$, thick and leathery, margins recurved, glossy green above, yellowish white felt below, closely set on stem. Fls. $\frac{1}{2}$, white, solitary and erect from terminal l.-axils. New Zealand. (Fig. 120 N)
- * *O. oleifolia* 9. July-August. Branchlets downy. Ls. lanc., 3, blunt-ended, glossy green above, white-felted below, very shortly stalked Fls. $\frac{1}{2}$, white, in branched clusters at end of twigs. New Zealand. (Fig. 120 P.)
- * *OZOTHAMNUS ANTENNARIA* 10. June-July. E. Branchlets angled, sticky, covered with grey or tawny scurf Ls. alternate, oblanc., 1, entire, dark green and smooth above, scurfy below, stalkless or nearly so Fls. $\frac{1}{2}$, dull white, in dense terminal clusters. Tasmania. (Fig. 120 J.)
- * *PACHYSTEGIA INSIGNIS* (OLEARIA INSIGNIS). 6. July E. Branches stout, densely hairy. Ls. alternate, broadly ov., 7, entire, blunt-ended, leathery, dark green above, white-felted below, stout-stalked. Fls. 3, white with yellow centre, long-stalked, solitary or in 2-5-flowered clusters at end of branchlets, ray florets very numerous. New Zealand. (Fig. 121 A.)

SENECIO Evergreen shrubs with thick alternate ls. which are usually felted on one or both sides Fls. yellow or white, with one row of sepal-like bracts.

(a) *Fl-heads without ray florets*

- S elaeagnifolius* (*S Buchanani*) 10 June Branchlets buff-felted. Ls ov, 5, entire, leathery, blunt-ended, glossy green above, buff-felted below, stalk grooved. Fls $\frac{1}{2}$, in terminal panicles New Zealand (Fig 121 B)
S rotundifolius 6 June-July. Branchlets grooved, white-felted Ls circular, 5, glossy green above, white-felted below, stalk grooved Fls. $\frac{1}{2}$, white, in close erect clusters New Zealand

(b) *Fl-heads with ray florets*

- * *S compactus* 3. September. Branchlets white-felted Ls. ov, 2, entire, blunt-ended, margins wavy. Fls $\frac{3}{4}$, yellow, in terminal racemes New Zealand. (Fig 121 C)
 * *S Greyi*. 8. June. Branchlets stout, white-felted Ls ov, 4, entire, blunt-ended, white-felted below and also on margins above. Fls 1, yellow, in terminal panicles New Zealand. (Fig 121 D)
 * *S. Haastii*. $\frac{1}{2}$. Low-spreading plant, white all over Ls nearly circular, 5, vaguely round-toothed, woolly. Fls 1, yellow, in terminal racemes up to 15 high New Zealand.
 * *S. Hectori*. 14. July. Branchlets stout, woolly Ls lanc, ov., 10, pinnately lobed at base, conspicuously toothed, warted above, grey down below Fls 2, white, in terminal flattish branched clusters. New Zealand. (Fig. 100 A)
 * *S. Huntii* 20 June-July Branchlets stout, clammy and downy Ls lanc. 4, entire, blunt-ended, rusty-felted below Fls $\frac{1}{2}$, yellow, in dense terminal panicles, fifteen to twenty ray florets Chatham Islands. (Fig 121 E)
 * *S laxifolius* 4. Summer. Branchlets grey, downy Ls ov., lanc., entire, blunt-ended, grey down above, white felt below Fls. 1, yellow, in loose terminal panicles. New Zealand. (Fig. 121 F.)
 * *S Monroii* 6. Branchlets white-felted Ls ov., 1, wrinkled or wavy at margin, blunt-ended, dull green above, white-felted below. Fls. $\frac{1}{2}$, yellow, on long, slender, glandular-downy stalks. New Zealand. (Fig 121 G)

(II) FL.-HEADS WITHOUT RAY FLORETS (GROUNDSEL SECTION). See also SENECIO.

ARTEMISIA Ls. alternate, greyish, strongly aromatic. Fls. small, yellow, without pappus, in terminal leafy spikes or panicles.

- A. Abrotanum*. Southernwood, Lad's Love, Old Man. 3. September. E. Ls. 3, pinnately or 2-pinnately dissected into fine linear lobes. South Europe. (Fig. 36 C.)
A. Absinthum. Wormwood. 3. July-October. E. Ls. 4, coarsely divided into lanc. or oblong lobes. South Europe. (Fig. 36 B.)
A. tridentata. Sage Brush. 8. August-September. E. Ls. linear, lanc, 1 $\frac{1}{2}$, grey-felted, 3-toothed at apex. West United States (Fig. 51 L.)

BACCHARIS. Groundsel Tree Ls. alternate, obov., oblanc., coarsely toothed, clammy with resin, stalkless or nearly so. Fls. small, white or yellowish white, in panicles, pappus silky.

BACCHARIS—continued

B. halimifolia 12 October. D. Branchlets angular, hairless. Ls 3, grey-green, resin-dotted, shortly stalked. North America (Fig. 100 B)

B. patagonica 9 May E Branchlets angled, scurfy, clammy Ls. 1, deep green, scurfy on both sides, stalkless South America. (Fig. 100 C.)

* BIGELOVIA (CHRYSOTHAMNUS) GRAVEOLENS. Plumed Golden Rod 8 October. E. Stems erect, grey Ls alternate, linear, 3, crowded, long-pointed, hairless, aromatic Fls. $\frac{1}{4}$, yellow, tubular, in flattish branched clusters. West North America. (Fig 51 M)

* BRACHYGLOTTIS REPANDA (SENECIO FORSTERI) 20 April. E. Branchlets white-felted Ls alternate, ov, 12, pointed, rounded or straight base; teeth large, unequal and lobe-like, dark green above, white-felted below. Fls small, greenish white, in large terminal panicles up to 16 wide New Zealand (Fig 100 D)

CASSINIA (DIPLOPAPPUS). Ls alternate, $\frac{1}{4}$, entire, dark green above, yellow below, crowded Fls small, white, in terminal branched clusters.

C. fulvida (*Diplopappus chrysophyllus*). Golden Bush. 6. July. E. Stems clammy. Ls mustard-yellow below New Zealand (Fig. 49 M)

C. leptophylla 4 July–August E. Stems not clammy. Ls. pale yellow or white below. New Zealand.

* EUPATORIUM MICRANTHUM (E. WEINMANNIANA). 9 September–November. E. Branchlets slender, hairless. Ls. opposite, ov, lanc, 4, pointed, thin, tapering base, vaguely toothed in outer half Fls $\frac{1}{4}$, white or rose-tinted, tubular, fragrant, in flattish branched clusters. Mexico (Fig 60 K.)

SANTOLINA CHAMAECYPARISSUS. Lavender Cotton 2 July. E Stems and ls white Ls alternate, 1, pinnately lobed, crowded Fls $\frac{1}{2}$, yellow, hemispherical, solitary at end of erect slender stalk South Europe. (Fig. 36 A.)

Family 57. VACCINIACEAE. K (4–5), C (4–5), A 8–10, \bar{G} (4–5)

CHIOGENES SERPYLLIFOLIA (C. HISPIDULA). Creeping Snowberry. May–June E Creeping plant. Ls. alternate, roundish, $\frac{1}{2}$, dark green above, pale below with a few reddish bristles Fls small, white, bell-shaped, solitary on curved stalks in 1-axils. Fruit a white berry. North America (Fig. 122 Q.)

GAYLUSSACIA. Huckleberry. Ls. alternate, very shortly stalked. Fls. white, bell-shaped, K (5), C (5), A10. Fruit a berry.

G. brachycera (*Vaccinium buxifolium*). Box Huckleberry. 1. May–June. E. Ls ov., 1, leathery, toothed, glossy green above. Fls $\frac{1}{4}$, white, faintly striped with red, cylindrical, contracted at mouth; in short-stalked axillary racemes. Berry blue. East United States. (Fig. 100 E.)

G. dumosa (*Vaccinium dumosum*). Dwarf Huckleberry. 2. May–June. D. Ls ov, lanc., 1 $\frac{1}{2}$, entire, glossy green. Fls $\frac{1}{4}$, bell-shaped, white, nodding. Berry black. Newfoundland and East United States

OXYCOCCUS. Cranberry. Prostrate shrubs with long wiry creeping stems. Ls. alternate, ov, $\frac{1}{2}$, entire, dark green above, bluish white below Fls. $\frac{1}{4}$, pink, corolla deeply divided and bent back revealing stamens. K (4), C (4), A8. Fruit a red berry.

OXYCOCCUS—continued

- O macrocarpus* (*Vaccinium macrocarpus*) American Cranberry September
E Ls. rounded at end Fls in terminal racemes ending in leafy shoot.
Berry $\frac{3}{4}$. East North America. (Fig 121 J)
- O palustris* (*Vaccinium Oxycoccus*) Cranberry June E. Ls. pointed Fls
in terminal 1-4-flowered clusters. Berry $\frac{1}{4}$ Northern Hemisphere
(including Britain). (Fig. 121 H)

VACCINIUM Ls alternate, very shortly stalked Fls small, white or pinkish,
bell-shaped, corolla not deeply divided Fruit a berry.

(a) *Deciduous*

- V. arboreum* Farkleberry 10 July–August Ls ov., 2, pointed, minutely
toothed, dark glossy green above, slightly downy below, margins slightly
recurved. Fls. $\frac{1}{2}$, bell-shaped, 5-lobed Berry $\frac{1}{4}$, black. East United
States (Fig. 100 F)
- V. Arctostaphylos*. Caucasian Whortleberry, Bear's Grape. 10 June Ls
ov., 4, pointed, finely toothed, dark dull green above, downy below
Fls. $\frac{1}{2}$, white tinged with purple, jointed to stalk, in axillary racemes.
Berry $\frac{1}{4}$, purple. Caucasus (Fig. 101 A)
- V. canadense* Sour-top, Velvet Leaf. 1 May Stems very downy. Ls lanc.,
 $1\frac{1}{2}$, entire, pointed. Fls. $\frac{1}{2}$, in short dense clusters Berry $\frac{1}{4}$, blue-black.
East North America (Fig. 121 N)
- V. corymbosum* Swamp Blueberry 12. May. Ls. ov, lanc, 3, tapering at
both ends, entire Fls $\frac{1}{4}$. Berry black with blue bloom East North
America (Fig. 121 M.)
- V. hirsutum* Hairy Huckleberry 2 May. Young stems very downy. Ls.
ov., $2\frac{1}{2}$, entire, pointed, dark green, downy, short-stalked. Fls. $\frac{1}{4}$,
cylindrical, hairy. Berry $\frac{1}{4}$, blue-black, hairy. Mountains of North
Carolina. (Fig. 121 L)
- V. Myrtillus*. Whortleberry, Bilberry. 1. May Branchlets flanged or angled,
hairless. Ls. ov, 1, round-toothed, bright green, hairless Fls $\frac{1}{2}$, round,
pale pink. Berry $\frac{1}{4}$, black with blue bloom Europe (including Britain)
(Fig. 100 G)
- V. pennsylvanicum* Low Blueberry. $1\frac{1}{2}$ April–May. Young stems warted,
downy. Ls lanc., $1\frac{1}{2}$, pointed, minutely toothed, bright green, hairless
Fls. $\frac{1}{4}$. Berry usually black with blue bloom, sometimes red or white
East North America. (Fig 101 E)
- V. stamineum* Deerberry. 4. May–June. Ls. ov., $2\frac{1}{2}$, pointed, entire, dark
dull green above. Fls. $\frac{1}{2}$, white, with projecting yellow stamens, in leafy
racemes. Berry $\frac{1}{4}$, greenish or yellowish. East United States
- V. uliginosum*. Bog Bilberry, Bog Whortleberry. 2. May. Ls. obov or
circular, 1, entire, stalkless. Fls. very small, in twos or threes on drooping
stalk. Berry black with blue bloom. Northern Hemisphere (including
Britain). (Fig. 121 K)
- V. vacillans*. Blue Huckleberry. 3. May. Stems yellowish green, hairless,
warted Ls. ov., obov., 2, minutely toothed or entire, firm, hairless.
Fls. $\frac{1}{4}$, pink, cylindrical, in short clusters. Berry $\frac{1}{4}$, black with blue bloom,
very sweet. U.S.A.

VACCINIUM—continued

(b) Evergreen

- * *V. glauco-album* 4 July Stems hairless Ls ov, 2, stiff and hard, pointed, toothed, green above, blue-white below Berry $\frac{1}{4}$, black with blue bloom. Himalaya (Fig 101 D)
- V. Mortina* Mortina. 4 May Branchlets dark, downy Ls ov, $\frac{1}{2}$, minutely toothed, crowded, pitted below Fls pink Berry red. South America (Fig 101 C.)
- V. ovatum* 12. September Branchlets purple, downy Ls ov, 1, leathery, finely toothed Fls white, in short nodding axillary racemes. Berry $\frac{1}{4}$, black West North America (Fig 101 B.)
- V. Vitis-Idaea* Cowberry $\frac{1}{2}$ May-June Low-creeping shrub. Branchlets yellowish green, warted, hairless Ls ov, 2, minutely toothed in outer half or entire, firm, hairless. Fls pink. Berry $\frac{1}{4}$, red Northern Hemisphere (including Britain) (Fig 101 F.)

Family 58 *ERICACEAE*. K4-5, C (4-5) or 4-5, A8-10, G (4-5)

Anthers 2-celled, opening by apical pores.

ANDROMEDA POLIFOLIA Bog Rosemary. $1\frac{1}{2}$ April. E Stems thin, wiry, hairless. Ls. alternate, linear, $\frac{1}{2}$, dark green above, felted or glaucous below, margins recurved Fls. $\frac{1}{4}$, pink, egg-shaped, in terminal clusters. Fruit an egg-shaped capsule. Northern and Arctic regions. (Fig. 51 B)

ARBUTUS. Ls. alternate, leathery, toothed, hairless, crowded towards end of branch. Fls. $\frac{1}{4}$, white or pinkish, pitcher-shaped, in terminal panicles. Fruit a berry.

A. andrachnoides 30. November-January. E Ls. ov., 4, dark green above, glossy below, stalk short and hairy. Berry $\frac{1}{2}$, red. Hybrid.

A. Menziesii Madrona. 100 May. E. Bark smooth, peeling, reddish brown Ls ov., oblong, 6, finely toothed or entire, dark green above, grey or white below, stalk short. Fl-panicles erect. Berry $\frac{1}{2}$, orange-coloured. California (Fig. 101 H.)

A. Unedo Strawberry Tree. 30. October-November. E Ls. ov., 4, tapering to both ends, sharply toothed, stalk hairy Fl-panicles drooping. Berry $\frac{3}{4}$, orange-red, rough. South Europe and Ireland (Fig. 101 J.)

ARCTERICA NANA (PIERIS NANA). Prostrate. April. E. Branchlets downy. Ls. in whorls of three, ov, $\frac{1}{2}$, entire, leathery. Fls. $\frac{1}{4}$, white, in small terminal clusters Fruit a dry capsule. Japan. (Fig. 72 L)

ARCTOSTAPHYLOS. Ls. alternate, leathery, entire Fls. pink, egg-shaped, nodding in terminal clusters. Fruit a red berry.

A. Manzanita. Manzanita. 25. March-April. E. Branchlets downy. Ls. ov., 2, unequal-sided, hard and stiff, greyish green, pitted. Fls. $\frac{1}{4}$. Berry $\frac{1}{2}$. California. (Fig. 122 B.)

A. Uva-ursi. Red Bearberry Prostrate. April-June. E. Ls. obov., 1, rounded at end, crowded, often in rosette-like tufts. Fls. very small, white or pinkish, in terminal clusters. Berry $\frac{1}{4}$, black. Northern Hemisphere (including Britain). (Fig. 122 A.)

ARCTOUS ALPINUS (ARCTOSTAPHYLOS ALPINA) Black Bearberry. $\frac{1}{2}$ April-June. D Ls obov., $1\frac{1}{2}$, thin, rounded at end, round-toothed towards apex, net-veined Fls. very small, white or pinkish, in terminal clusters. Berry $\frac{1}{4}$, black Northern Hemisphere (Fig 101 G.)

BRUCKENTHALIA SPICULIFOLIA $\frac{1}{2}$. May-June. E. Ls linear, $\frac{1}{4}$, in whorls of four, sharp-pointed, downy. Fls. small, pink, bell-shaped, in dense terminal spikes, corolla persistent, C (4), A8. Fruit a dry capsule. East Europe and Asia Minor. (Fig. 48 B)

CALLUNA VULGARIS. Ling. Heather 3 August-September E Ls opposite, minute, scale-like, in four rows, keeled. Fls. purplish pink, in thin terminal spikes, corolla persistent, C (4), A8 Fruit a dry capsule Europe (including Britain). (Fig. 48 P)

Variety *alba*. Fls white, ls bright green.

Variety *alba aurëa*. Fls. white; ls. golden

Variety *alba pilosa*. Fls. white; ls greyish

Variety *Alportii* Tall, fls. crimson

Variety *argentea*. Fls. purple; ls. silvery.

Variety *aurea* Fls. purple, ls gold

Variety *coccinea*. Fls. red; ls greyish.

Variety *cuprea* Tall; fls purple, ls red to bronze in winter.

Variety *flore pleno*. Fls. double, pale pink

Variety *Foxii*. Dwarf cushiony tufts, fls. pink

CASSANDRA (CHAMAEDAPHNE, ANDROMEDA) CALYCVLATA Leather Leaf. 2. March-April. E. Ls alternate, ov., $1\frac{1}{2}$, finely toothed in outer half, scurfy or scaly below Fls $\frac{1}{4}$, white, bell-shaped, solitary in l.-axils, K5, C (5), A10. Fruit a dry capsule Northern Hemisphere (Fig 101 K.)

Variety *nana*. Dwarf form

CASSIOPE (ANDROMEDA). Ls opposite, minute, scale-like, in four rows, keeled Fls. solitary, white or pinkish, nodding, K5, C (5), A10. Fruit a dry capsule

C. fastigiata. Himalayan Heather. April-May. E. Ls with silvery margin. Himalaya. (Fig. 48 Q)

C. tetragona. April-May E Ls without silvery margin Arctic regions

CLADOTHAMNUS PYROLAEFLORUS. 10. June. D Branchlets reddish, angular, hairless. Ls alternate, obov., oblanc., 2, entire, hairless, stalkless or nearly so Fls. 1, pink, K5, C5, A10; corolla deeply divided into five separate petals, solitary or in twos or threes at end of shoot. Fruit a dry capsule. West North America (Fig. 124 F.)

CLETHRA. Ls. alternate, ov., lanc., tapering base, toothed except at base, prominently veined. Fls. white or pinkish, in terminal racemes or panicles, K5, C (5), A10, corolla deeply divided into five separate petals. Fruit a dry capsule.

C. acuminata. White Alder. 20. July-August. D. Ls. 6, long-pointed, with 10-15 pairs of veins, nearly hairless, crowded at end of shoot. Fls. in solitary spikes. South-east United States. (Fig. 102 B)

C. alnifolia. Sweet Peppermint. 8. August-September. D. Ls. obov., oblanc., 4, short-pointed, with 7-10 pairs veins, nearly hairless. Fls. fragrant. East North America. (Fig. 102 A.)

CLETHRA—continued

* *C. arborea* Lily-of-the-Valley Tree. 25 August–October E. Branchlets reddish Ls oblanc, 6, dark green and smooth above, hairy below, stalk reddish, hairy Fls fragrant, in several terminal spikes Madeira (Fig 102 D)

C. barbinervis (*C. canescens*) 6 July–September. D. Ls obov, 5, slightly hairy below, 10–15 pairs of veins Fls. fragrant, in several terminal spikes (China and Japan)

* *C. Delavayi* 40 August–September D. Ls lanc, bright green above, very downy below, 10–15 pairs of veins Fls $\frac{1}{2}$, in one-sided, solitary terminal spikes China (Fig 102 L)

C. tomentosa 8 August–September. D Ls obov., dark green and rough above, pale and woolly felted below, 7–10 pairs of veins. South-east United States (Fig. 102 c)

DABOECIA (MENZIESIA) POLIFOLIA St. Dabeoc's Heath 1 May–September. E Ls alternate, lanc., $\frac{1}{2}$, entire, dark glossy green above, white-felted below. Fls $\frac{1}{2}$, rosy purple, egg-shaped, in terminal racemes, K₄, C (4), A8, corolla deciduous. Fruit a dry capsule. Ireland, West France, Spain, Portugal, Azores (Fig 48 c)

Variety *alba*. Fls white

Variety *bicolor* Some fls. white, some purple

ELLIOTTIA RACEMOSA 20. July–August. D Ls alternate, ov, lanc, 4, entire, thin, hairy below, stalk slender and swollen at base nearly concealing bud. Fls. $\frac{1}{2}$, white, fragrant, in terminal racemes or panicles, K₄, C (4), A8, petals recurved and nearly separate. Fruit unknown (increases by root suckers). Georgia. (Fig. 122 D)

ENKIANTHUS. Branches in whorls Ls alternate or whorled, ov, finely toothed. Fls. $\frac{1}{4}$, bell-shaped, in drooping clusters, K₅, C (5), A10. Fruit a dry capsule.

E. campanulatus. 20. May. D. Fls. creamy yellow veined with red. Japan. (Fig. 55 G)

Variety *albiflorus* (*pallidiflorus*) Fls. nearly white.

E. cernuus. 15 May D. Fls. white, petals toothed. Japan

E. japonicus (*E. perulatus*). 6. May. D. Fls. white, pitcher-shaped (contracted at mouth). Japan.

EPIGAEA REPENS. May Flower. $\frac{1}{2}$. May. E Creeping shrub. Stems hairy, rooting. Ls. alternate, roundish ov., 3, leathery, distantly toothed, short bristles on both sides. Fls. $\frac{1}{2}$, white or pinkish, bell-shaped, in terminal heads. Fruit a dry capsule. North America (Fig. 102 E)

ERICA. Heath, Heather. Ls. usually whorled, linear, $\frac{1}{4}$ or less, blunt-ended, margins recurved. Fls. small, pink, white, or purple, egg-shaped, K (4), C (4), A8, corolla persistent. Fruit a dry capsule.

(a) *Ls. mostly alternate*

E. lusitanica. 12. February–May. E. Fls. white, fragrant. Spain and Portugal. (Fig. 48 F.)

ERICA—continued

(b) *Ls. in whorls of three*

- E. arborea*. Tree Heath 20 March–May. E Branchlets with branched hairs Fls. white, fragrant Mediterranean region.
- E. calaris*. Fringed Heath. 1. June–October E Ls. hairy, whitish below Fls. rosy red, in terminal spikes South-west Europe (including Cornwall). (Fig 48 J)
- E. cinerea* Scotch or Grey Heath, Bell Heather. 1½ July–September. E Ls. hairless Fls. bright purple, in terminal clusters West Europe (including Britain) (Fig 48 G)
- E. scoparia*. Besom Heath. 10. May–June. E Fls. greenish Central France.
- E. Vetchui* 20 March–May. Like *E. arborea*, but branchlets have simple hairs. Hybrid

(c) *Ls. in whorls of four or more*

- E. australis*. Spanish Heath 6 May. E Young stems very downy Fls. purplish red, in small clusters Spain.
- E. carnea*. ½ February–May E. Young stems hairless Ls. hairless. Fls. rosy red, solitary or in pairs in l.-axils Europe. (Fig 48 E)
Variety *alba* (*E. herbacea*) Fls. white
- E. darleyensis*. 2. November–May. E. Like *E. carnea*, but growing taller. Hybrid
- E. mediterranea*. 10. April–May. Like the previous two, but with a single upright main stem South-west France and Spain.
- E. stricta*. 9. June–September E Ls. minutely downy. Fls. pink, in terminal clusters. South Europe.
- E. Tetralix*. Cross-leaved Heath 1½. June–September. E. Ls. hairy, white below, arranged in form of cross. Fls. pink, in dense terminal clusters. Europe (including Britain). (Fig 48 H)
Variety *mollis*. Ls. greyish white
- E. vagans*. Cornish Heath 2½. August–September. E. Ls. hairless Fls. pinkish purple, in long terminal spikes. South-west Europe (including Cornwall). (Fig. 48 D)

GAULTHERIA Branchlets zigzagged. Ls. alternate, ov., stiff, toothed, stalk red and hairy. Fls. ¼, pinkish white, egg-shaped, K (5), C (5), A10. Fruit a berry

G. procumbens. Creeping Wintergreen, Checkerberry, Partridge Berry. ½. July–August. E. Creeping roots send up thin erect stems with small cluster of ls. at top. Ls. ov., 1, minutely toothed. Fls. solitary. Berry ¼, red North America. (Fig. 102 N.)

G. Shallon. Shallon. 6. May–June. E. Spreading by underground stems. Branchlets reddish, bristly. Ls. ov., 4, pointed, toothed. Fls. in clammy racemes, each fl. in axil of hooded bract. Berry ¼, black, hairy, juicy. West North America. (Fig. 102 M.)

KALMIA. Mountain Laurel. Ls. crowded radially at end of branches, ov., lanc., entire. Fls. saucer-shaped, in branched or unbranched clusters, K (5), C (5), A10. Fruit a dry egg-shaped capsule.

K. angustifolia. Sheep Laurel 4. June. E. Ls. opposite or in threes, ov., 2, bright green above, hairless, short-stalked. Fls. ¼, pink, in rounded clusters. North America.

KALMIA—continued

K. glauca (*K. polifolia*) 2. April E Ls. opposite or in threes, ov, $1\frac{1}{2}$, dark glossy green above, white below Fls. $\frac{1}{2}$, rosy purple, in flattish clusters North America

K. latifolia. Calico Bush 10 June E. Ls. alternate, ov, lanc, 5, glossy green above, stalk red Fls. $\frac{3}{4}$, white to deep rose. North America. (Fig 124 G)

LEDUM Stems rusty-felted. Ls. alternate, entire, rusty-woolly below Fls. $\frac{1}{2}$, white, with separate spreading petals, K₅, C₅, A₅₋₁₁, in terminal clusters. Fruit a dry capsule

L. latifolium Labrador Tea 2. May E Ls. ov, lanc, 2, blunt-ended, midrib not visible below North America

L. palustre Marsh Ledum, Wild Rosemary 4. May. E. Ls. linear, 1, midrib visible below. Arctic regions (Fig 52 A)

LEIOPHYLLUM BUXIFOLIUM. Sand Myrtle. $1\frac{1}{2}$. May-June. E. Ls. opposite and alternate, ov, $\frac{1}{2}$, entire, leathery, glossy, hairless Fls. $\frac{1}{4}$, white or pinkish, with separate spreading petals, K₅, C₅, A₁₀, in crowded terminal clusters. East North America (Fig 67 F.)

LEUCOTHOE (ANDROMEDA). Ls. alternate, lanc., finely toothed, short-stalked. Fls. $\frac{1}{4}$, white, bell-shaped, in racemes or panicles, K (5), C (5), A₁₀. Fruit a dry capsule.

(a) *Deciduous*

L. racemosa. 6 June. Branchlets slender, erect, downy. Ls. 2, firm, short-pointed, shallowly round-toothed, downy on veins below. Fls. in erect 1-sided racemes. North America (Fig. 102 J.)

L. recurva. 5. May-June. Branchlets spreading. Ls. 4, thin but firm, short-pointed. Fls. in curved racemes. Virginia to Alabama.

(b) *Evergreen*

L. axillaris. 6. April-May Branches arching. Ls. 4, short-pointed, distantly toothed, glossy above. Fls. in axillary racemes. South-east United States. (Fig 102 F.)

L. Catesbaei. 6. May. Branchlets slender, arching, zigzagged. Ls. 5, leathery, long-pointed, closely spine-toothed, a few hairs below. Fls. in axillary racemes. South-east United States. (Fig. 102 G.)

L. Davisiae. 3. May. Branchlets stout, erect, hairless. Ls. 2, firm, short-pointed, minutely toothed, hairless. Fls. in terminal panicles. North America. (Fig 102 H.)

LOISELEURIA PROCUMBENS. Alpine Azalea. $\frac{1}{2}$. June. E Ls. opposite, ov., $\frac{1}{4}$, entire, whitish below, margins recurved. Fls. $\frac{1}{4}$, white or pinkish, erect, bell- or star-shaped, in terminal clusters, K₅, C (5), A₅. Fruit a dry capsule. North Europe (including Scottish Highlands), North Asia, North America. (Fig. 48 K.)

LYONIA (ANDROMEDA, XOLISMA) LIGUSTRINA. Male-berry. 8. July. D. Branchlets zigzagged. Ls. alternate, ov., lanc., 3, entire, pointed, downy on both sides, prominently veined, very shortly stalked. Fls. very small, round, dull white, in few-flowered terminal racemes, K (5), C (5), A₁₀. Fruit a dry capsule. North America. (Fig. 122 E.)

MENZIESIA PILOSA. 6. May D Bark peeling, branchlets hairy Ls. alternate, ov, 2, entire, thin, with scattered hairs Fls $\frac{1}{4}$, white, bell-shaped, A8-10, in few-flowered clusters at end of short side shoots. Fruit a dry capsule East North America. (Fig. 124 D.)

OXYDENDRUM ARBOREUM (*ANDROMEDA ARBOREA*, *LYONIA ARBOREA*) Sorrel Tree. 50 August-September. D Branchlets hairless. Ls alternate, ov., lanc, 6, minutely toothed, thin, hairless or nearly so Fls $\frac{1}{4}$, white, bell-shaped, in terminal panicles, K5, C (5), A10. North America. (Fig. 102 K)

PERNETTYA MUCRONATA Prickly Heath 5. May-June E Stems sucker freely; branchlets wiry. Ls alternate, ov., $\frac{3}{4}$, spiny-pointed, toothed, leathery. Fls $\frac{1}{4}$, white, bell-shaped, nodding, solitary in l.-axils, K (5), C (5), A10 Fruit a berry, $\frac{1}{2}$, white, pink, lilac, crimson, purple or black. South America. (Fig. 103 A)

PHYLLODOCE. Low heath-like shrubs. Ls. alternate, linear, $\frac{1}{2}$, blunt-ended, toothed, margins recurved, crowded. Fls bell- or egg-shaped, slender-stalked, solitary or in terminal clusters, K (4-6), C (4-6), A8-12. Fruit a dry capsule

P. Breweri. 1. May E. Fls $\frac{1}{2}$, purple, broadly bell-shaped. California.

P. coerulea $\frac{3}{4}$ May E. Fls. $\frac{1}{4}$, bluish purple, egg-shaped. Alpine regions of Northern Hemisphere (Fig. 48 A.)

P. empetriformis. $\frac{3}{4}$. May. E Fls. $\frac{1}{4}$, reddish purple, egg-shaped, solitary in terminal l.-axils. West North America.

P. nipponica. $\frac{3}{4}$. May. E Fls. $\frac{1}{4}$, pinkish white, bell-shaped, solitary in terminal l.-axils. Japan.

PIERIS (*ANDROMEDA*). Ls. alternate. Fls. white, pitcher-shaped, usually in terminal panicles, K5, C (5), A10; anthers with reflexed awns. Fruit a dry capsule.

(a) *Ls. entire, deciduous*

P. Mariana (*Xolsma Mariana*). Stagger Bush. 6. June. Branchlets hairless Ls. ov., lanc, 3, thin but stiff, hairless, veins prominent below Fls. $\frac{1}{2}$, nodding, in lateral racemes. East United States. (Fig. 122 G.)

* *P. ovalifolia*. 20 June. Branchlets hairless. Ls. ov., 5, firm, conspicuously veined, hairless or nearly so. Fls. $\frac{1}{4}$, nodding, in 1-sided terminal and axillary racemes. Himalaya. (Fig. 122 F.)

(b) *Ls. toothed, evergreen*

P. floribunda. 6. March-April. Branchlets stiff, hairy. Ls. lanc, 3, minutely toothed, glossy green above, hairy. Fls. $\frac{1}{4}$, in erect panicles. South-east United States. (Fig. 103 E)

P. formosa. 20. May. Branchlets hairless. Ls. lanc., 7, leathery, glossy, minutely toothed, hairless. Fls. $\frac{1}{4}$, nodding, in drooping panicles, sepals green. Himalaya, China. (Fig. 103 D)

P. Forrestii. 10. April. Branchlets hairless, reddish. Ls. ov., lanc., 4, finely toothed, hairless. Fls. $\frac{1}{2}$, fragrant, in drooping panicles, sepals white. Upper Burma and China.

P. japonica. 10. March-April. Branchlets brown, rough with scars of fallen ls., often opposite or whorled. Ls. ov., lanc, 3, hairless, crowded radially at end of shoot. Fls. $\frac{1}{4}$, in drooping racemes. Japan. (Fig. 103 C.)

RHODODENDRON. Buds large, pointed, many-scaled, the terminal one usually in centre of a group of radially arranged ls. Ls alternate, entire. Fls usually large and showy, funnel-shaped or bell-shaped, usually in terminal clusters, ovary 5-10-celled, with long style. Fruit a dry splitting capsule

(I) DECIDUOUS OR HALF EVERGREEN; STAMENS
USUALLY FIVE

(AZALEA SECTION)

- R. indicum* (*Azalea indica*) Indian Azalea 6 May Young shoots bristly. Ls ov., obov., 3, bristly. Fls. 2, red, solitary or in pairs, anthers purple. China and Japan (Fig. 122 H.)
- R. Kaempferi* (*Azalea indica*, variety *Kaempferi*) 10 May Ls. ov., 2½, bristly. Fls. 2, red, in few-flowered terminal clusters, stamens yellow Japan.
- R. luteum* (*Azalea pontica*) 10. May Buds with sharply pointed scales Ls lanc., 5, hairy on margins and midrib below. Fls. 1½, yellow, in crowded clusters Caucasus (Fig. 122 J)
- R. molle* (*Azalea mollis*) 8. April-May. Ls lanc., 4, dark green, slightly hairy. Fls. 3, pink or red, in clusters appearing before ls. Japan. (Fig. 122 K.)
- R. occidentale* (*Azalea occidentalis*). 8. June. Ls ov., lanc., 4, glossy green above, with scattered hairs Fls. 3, white with yellow blotch, in terminal clusters appearing after ls. West North America. (Fig. 122 P.)
- R. quinquefolium*. 3. April-May. Ls. 1½, in whorls of five at end of shoot. Fls. 1½, white or pinkish, solitary or in pairs, stamens ten. Japan. (Fig. 70 K.)
- R. Rhodora* (*Rhodora canadensis*). 4. April. Ls. ov., lanc., 2, bristly above and on margins, downy or hairless below. Fls. 1, rosy purple, 2-lipped, in lateral and terminal clusters, stamens ten. East North America. (Fig. 122 O)
- R. sinense* (*Azalea sinensis*). Chinese Azalea. 8. April-May. Branchlets soft-felted. Ls. lanc., 4, velvety-felted below. Fls. 3, yellow, in clusters appearing before ls. China. (Fig. 122 N.)
- Many hybrids between this and *R. molle* in cultivation.
- R. viscosum* (*Azalea viscosa*). Swamp Honeysuckle. 8. June. Ls. obov., 2, margins bristly. Fls. 1, white or pink, covered with sticky hairs, in clusters. North America. (Fig. 122 M.)

(II) EVERGREEN; STAMENS USUALLY TEN

(RHODODENDRON SECTION)

(a) Ls. with small scurfy scales on under surface

- R. Anthopogon*. 2. April. Branchlets hairy. Ls. ov., 1½, glossy green above, brown scales below, aromatic when crushed. Fls. 1, sulphur-yellow, in small terminal clusters, stamens five to eight. Himalaya. (Fig. 122 L)
- * *R. arboreum*. 40. February-March. Ls. lanc., 7, silver scales below. Fls. 2, blood-red, in terminal hemispherical heads. Himalaya. (Fig. 123 C.)
- Variety *album*. Fls. white; ls. rust-coloured below.

RHODODENDRON—continued

- R. arbutifolium* 4 May Ls. lanc, 2, dull dark green above, minute glistening silvery scales below Fls 1, rose-coloured Hybrid.
- R. cinnabarinum*. 10 May Ls ov., 4, metallic green above. Fls. $1\frac{1}{2}$, dull red, funnel-shaped, in terminal heads. East Himalaya (Fig. 123 A)
- R. dauricum* 6. January–February Ls ov, 1, rounded at end, dark glossy green above Fls 1, rosy purple, saucer-shaped, solitary or in pairs. Manchuria
- R. ferrugineum*. Rose des Alpes, Alpenrose 3. June. Ls. lanc, $1\frac{1}{2}$, glossy green above, rust-coloured scales below Fls $\frac{1}{2}$, red, in terminal clusters Alps. (Fig. 123 B)
- R. glaucum*. 6 May. Ls ov, lanc, 3, dark dull green above, scaly white or brown below, margins recurved. Fls. 1, rosy red, in terminal clusters. East Himalaya.
- R. Hanceanum* 4. March Ls. lanc, 4, hard, slender-pointed, dark green and scaly above and below Fls 1, white or yellow, funnel-shaped, petals deeply lobed China
- R. hirsutum*. Rose des Alpes, Alpenrose 3 June. Like *R. ferrugineum*, but stems and ls. bristly. Alps.
- R. lepidotum* 2. June. Ls. ov, lanc., $1\frac{1}{2}$, dotted with tiny scales. Fls. 1, rosy crimson, spotted, saucer-shaped, solitary or in few-flowered clusters Himalaya.
- R. moupinense* 3. March. Branchlets hairy. Ls ov, $1\frac{1}{2}$, leathery, ending in minute point, dark green above, pale below. Fls. 2, white or pink with purple or yellow spots, usually in 3-flowered clusters. China. (Fig. 123 E)
- R. Nobleanum*. See under (b)
- R. praecox*. 4. March Ls. ov., 2, dark glossy green, bristly above. Fls. 2, rosy purple. Hybrid (Fig. 123 D.)
- R. racemosum* 6. April–May. Ls ov., 1, white below dotted with brown scales. Fls. 1, pink, in axillary and terminal clusters. West China.
- R. yunnanense*. 12. May. Ls. lanc, 3, bright green above, hairy on margins, slightly scaly on both sides Fls. $1\frac{1}{2}$, pink with brown spots, in few-flowered clusters.* China.

(b) *Ls. felted or woolly on under surface*

- R. campanulatum*. 12. April–May. Bark peeling, branchlets hairless. Ls. ov., 5, green above, reddish brown below. Fls. 2, pale purplish pink or lilac, in loose clusters. Himalaya. (Fig. 123 F.)
- R. caucasicum*. 2. April–May. Ls. ov., 4, dark green above, red below, stalk short. Fls. 2, yellowish white or pale lilac, in terminal clusters. Caucasus.
- Variety *sulphureum*. Fls. sulphur-yellow.
- * *R. coriaceum*. 25. March. Ls. oblanc., 10, dark green above, grey-white below. Fls. 1, white or rose-tinted with crimson blotch, in loose trusses, stamens ten to fourteen. China.
- R. Falconeri*. 30. March–April. Ls. ov., lanc., 12, thick, strongly veined, dark green and wrinkled above, rusty below. Fls. 2, 8–10-lobed, cream-white with dark purple blotch at base, stamens twelve to sixteen. Himalaya. (Fig. 123 H.)
- R. fictolacteum*. 30. April–May. Ls. lanc., 8, dark green above, red below

RHODODENDRON—*continued*

- stalk felted Fls 2, white, 7-8-lobed, in large trusses, stamens fourteen to sixteen China. (Fig 123 J)
- R. fulgens* 12 February–March Ls. ov, 4, red below Fls. 1, blood-red, in hemispherical trusses. East Himalaya
- R. fulvoides* 20. April Young shoots brown-felted Ls ov, 8, leathery, dark green above, yellow below, midrib prominent Fls 1, white or pink with crimson blotch, in round trusses China
- R. fulvum* 20 April. Like *R. fulvoides*, but ls red below China
- R. Hodgsoni* 20 Bark peeling Ls lanc., 12, very leathery, dark green and glossy above, red below, stalk very thick Fls. 2, rosy lilac, 8-10-lobed, in round trusses, stamens fifteen to twenty. East Himalaya.
- R. Nobleanum* 15. January–March. Ls. lanc., 6, thin, brown below. Fls. 1½, bright rose, in hemispherical trusses. Hybrid. (Fig 123 G)

(c) *Ls. with scattered hairs or bristles*

- R. amoenum* (*Azalea amoena*) 4 May. Ls. ov, 1, dark glossy green. Fls ¾, rosy purple, sepals similar to petals, giving appearance of one flower growing out of another. Japan. (Fig 123 K)
- * *R. ciliatum* 9. March–April. Ls. ov, 4 Fls. 2, pink, in few-flowered clusters. East Himalaya. (Fig. 124 A.)
- R. ledifolium* (*Azalea ledifolia*). 6 May–June. Ls lanc., 2½, hairy all over. Fls. 2, white, solitary or in pairs or threes. China and Japan

(d) *Ls. hairless and smooth*

- R. barbatum*. 20. March Ls lanc., 9, pointed, dark dull green above, pale green below. Fls. 1½, blood-red, in hemispherical trusses. Himalaya
- R. campylocarpum* 8 May. Ls. ov, 4, fine-pointed, dark glossy green above, blue-white below. Fls. 3, pale yellow, bell-shaped, slightly fragrant, in loose terminal clusters. East Himalaya.
- R. catawbiense*. 10. June. Ls ov., lanc., 6, dark glossy green above, pale green or whitish below Fls 2½, lilac, in large clusters. South-east United States.
- R. croceum* 20. May Ls. ov., 4, heart-shaped base, pale green below. Fls. 3, yellow with crimson blotch, in 7-8-flowered clusters. China (Fig. 124 B)
- R. decorum*. 12. April–May. Ls. ov., lanc, 6, thick, grey-green above, glaucous below Fls. 2, white to pink spotted with green, 5-7-lobed, stamens twelve to sixteen. West China.
- R. discolor*. 18 June–July. Ls. lanc., 8, dark green above, whitish below. Fls 3, white or purplish, funnel-shaped, 6-7-lobed, stamens twelve to sixteen. Central China.
- R. Fortunei*. 12. May. Ls. ov., oblong, 8, pale green above, glaucous below; stalk stout, purple Fls 3, white or pinkish, 5-7-lobed, in loose terminal clusters, stamens fourteen to sixteen. China.
- * *R. Griffithianum* (*R. Aucklandi*). 15. Ls. lanc., 9, pale green above, glaucous below. Fls. 6, white or pinkish, widely bell-shaped, slightly fragrant, in loose clusters, stamens ten to sixteen. East Himalaya.
- R. ponticum*. 15. June. Ls. lanc., 9, dark glossy green above, pale green

RHODODENDRON—continued

below. Fls. 2, purple, in terminal heads. Spain, Portugal, Asia Minor (Fig. 124 C)

* *R. sino-grande*. 30 Young shoots stout, silvery. Ls. ov, 16, dull green above, silvery below. Fls. 2, white with crimson blotch, 10-lobed, in large terminal clusters, stamens eighteen. China.

R. Souliei. 8. May Young shoots purplish, clammy. Ls. ov, 3, heart-shaped base, blunt-ended, glaucous and metallic. Fls. 3, white or pink, saucer-shaped, 5-6-lobed, in terminal clusters, stamens eight to ten. China

R. Thomsoni. 12. April Ls. roundish ov, 4, dark green above, blue-white below. Fls. 2, blood-red, bell-shaped, in loose clusters. East Himalaya (Fig. 123 L)

RHODOTHAMNUS (RHODODENDRON) CHAMAECISTUS 1. April. E Ls. ov, $\frac{1}{2}$, edged with conspicuous bristles, closely set on branches. Fls. 1, pink, petals spreading, in terminal few-flowered clusters. K5, C (5), A10. Fruit a woody capsule. Austrian Alps (Fig. 124 H)

THERORHODION (RHODODENDRON) CAMTSCHATICUM $\frac{1}{2}$ May–June. E Spreading by underground suckers Ls. ov, 2, bristly below and conspicuously so on margins, stalkless. Fls. 1 $\frac{1}{2}$, crimson, petals spreading, solitary or in pairs on erect bristly stem, K (5), C (5), A10. Fruit a dry capsule. North Asia and Alaska. (Fig. 124 J.)

TRIPETALEIA (ELLIOTTIA) PANICULATA. 6. July–August D. Branchlets reddish brown, angled Ls. alternate, ov., 2, entire, hairless or nearly so, short-stalked. Fls. $\frac{1}{2}$, white or pinkish, K3, C3, A6, corolla divided into three distinct petals, in terminal racemes or panicles. Fruit a small capsule. Japan. (Fig. 124 E.)

ZENOBIA (ANDROMEDA) PULVERULENTA (Z. SPECIOSA) 6. June–July. D. Ls. ov., 2, shallowly and distantly toothed, blunt-ended, hairless, usually covered with white bloom. Fls. $\frac{1}{4}$, white, bell-shaped, drooping at end of long stalks in axillary clusters, K (5), C (5), A10. Fruit a dry round capsule with long persistent style. South-east United States. (Fig. 103 B)

Family 59. EPACRIDACEAE. K5, C (5), A5, ♀ (5)

Differs from *Ericaceae* in the anthers being 1-celled and opening by longitudinal slit.

LEUCOPOGON FRASERI. Australian Beard Heath. 1. E. Ls. alternate, linear, lanc., $\frac{1}{2}$, sharp-pointed, glossy above, veined below. Fls. $\frac{1}{2}$, white, solitary in 1-axils. Fruit $\frac{1}{4}$, a dry, oblong, yellowish-orange berry. Australia. (Fig. 122 C.)

Family 60. DIAPENSIACEAE. K (5), C (5), A5, ♀ (3)

Anthers 2-celled, opening by longitudinal slits.

DIAPENSIA LAPONICA. $\frac{1}{4}$. June–July. E. Prostrate. Ls. opposite, obov., $\frac{1}{2}$, entire, crowded in rosette-like tufts. Fls. $\frac{3}{4}$, white, bell-shaped, solitary on stalk up to 1 long. Fruit a dry capsule. Alpine and arctic regions of Northern Hemisphere (Fig. 67 E.)

PYXIDANTHERA BARBULATA Flowering Moss. Prostrate and creeping. April–May. E. Ls. alternate, oblanc., $\frac{1}{4}$, slightly hairy near base. Fls. $\frac{1}{2}$, white or pink, bell-shaped, stalkless. East North America. (Fig. 49 B.)

Family 61 *PLUMBAGINACEAE*. K (5), C (5), A₅, G₁
(Thrift, Sea Lavender)

CERATOSTIGMA Leadwort, Shrubby Plumbago Ls alternate, entire, covered with forward-pointing hairs or bristles Fls bright blue, in terminal heads. Fruit a dry capsule

C Griffithu. 3 August–September D Ls obov., 1, short-pointed, dull green with purplish margins Fls $\frac{1}{2}$ Himalaya. (Fig 124 M.)

C Willmottianum 4 July–November. D Ls diamond-shaped, 2, long-pointed. Fls. $\frac{3}{4}$ China

Family 62 *MYRSINACEAE*. K (5), C (5), A₅, G₁

Fruit a berry.

* *ARDISIA JAPONICA* 1. August–September E Ls. whorled, ov, 3, tapered at both ends, toothed, glossy green, hairless Fls. $\frac{1}{2}$, white, star-shaped, solitary or in few-flowered clusters in 1-axils. Berry $\frac{1}{4}$, red or white. China and Japan. (Fig. 103 G.)

MYRSINE AFRICANA 3. Summer E. Branchlets angled, downy. Ls. alternate, ov, $\frac{3}{4}$, tapered at base, toothed in outer half, glossy green, hairless, closely set on branch. Fls. very small, pale brown, unisexual, in stalkless axillary clusters. Berry $\frac{1}{4}$, pale blue, 1-seeded. Himalaya, South Africa, Azores. (Fig. 103 F)

Family 63 *SAPOTACEAE*. K (5), C (5), A₅, G₍₁₀₎

* *BUMELIA* (*SIDEROXYLON*) *LYCIOIDES* Southern Buckthorn. 20. August–September. D. Branchlets hairless, spiny. Ls alternate, ov., lanc, 4, entire, thin and firm, hairless, with pale thin conspicuous midrib, slender-stalked. Fls. very small, white, in hemispherical axillary clusters. Fruit $\frac{1}{2}$, a black berry. South United States. (Fig. 124 L.)

Family 64. *EBENACEAE*. K (3–7), C (3–7), A ∞ , G_(2–16)

DIOSPYROS. No terminal bud Ls. alternate, ov, entire, tapered at both ends. Fls unisexual, white, 4-lobed, sexes on different trees, female solitary Fruit a large juicy berry with persistent calyx.

D. Kak. Chinese Persimmon, Kakee. 50. June. D. Ls. 8, glossy above, downy below. Fruit 3, yellow. Japan.

D. Lotus. Date Plum. 50. June. D. Ls. 5, dark glossy green above, hairless or nearly so. Fruit $\frac{3}{4}$, yellow or purplish Temperate Asia. (Fig. 124 K.)

D. virginiana. Persimmon. 100. May–June. D. Ls. 5, glossy green above, hairless or nearly so. Fruit 1, pale yellow with red cheek. U.S.A.

Family 65. *STYRACEAE*. K (4–5), C (4–5), A_{8–∞}, G_(2–5)

HALESIA. Snowdrop Tree, Silver Bell Tree. Ls. alternate, ov., pointed, minutely and distantly toothed. Fls. white, drooping in axillary clusters on old wood, K (4), C (4), A_{8–16}, G₁. Fruit dry, pear-shaped, winged.

H. carolina. 30. May. D. Bark peels off in small scales. Ls. 4, downy below

HALESIA—continued

with star-shaped hairs Fls $\frac{3}{4}$ Fruit up to $1\frac{1}{2}$, 4-winged South-east United States (Fig 104 A)

H. diptera. 15 May. D Ls. 5, nearly hairless. Fls $\frac{3}{4}$, deeply lobed Fruit $1\frac{1}{2}$, 2-winged South-east United States (Fig 104 B)

H. monticola. 100 May. D Ls 5, nearly hairless. Fls. 1. Fruit 2, 4-winged South-east United States (Fig 104 C.)

PTEROSTYRAX (HALESIA) HISPIDA. Asagara, Epaulette Tree 40 June–July D Branchlets hairless Ls alternate, ov, 8, tapering base, pointed, minutely toothed, downy below or nearly hairless. Fls. $\frac{1}{4}$, white, fragrant in drooping axillary panicles, K (5), C (5), A 10, \bar{G} . Fruit $\frac{1}{2}$, dry, spindle-shaped, 5-10-ribbed, calyx persistent China and Japan (Fig. 104 D.)

STYRAX Buds with one outer scale. Ls alternate, ov, minutely toothed, very shortly stalked. Fls. 1, white, in racemes or clusters at end of short side twigs, K (5), C (5), A 10, \bar{G} . Fruit egg-shaped, enclosed in persistent calyx

S. americanum American Storax 8 June–July D Ls ov, lanc., 3, wedge-shaped base, nearly hairless Fls in few-flowered racemes Fruit $\frac{1}{4}$ South-east United States

S. Hemsleyanum. 30. June. D. Ls obov., 5, nearly hairless Fls. in many-flowered racemes. China.

S. japonicum. 25. June–July D. Ls. ov, 3, distantly toothed, hairless except for tufts in vein-axils Fls hanging vertically in few-flowered clusters Fruit $\frac{1}{2}$. China and Japan. (Fig 104 G.)

S. Obassia 30 June. D Ls roundish ov., 8, toothed in outer half, downy below, stalk swollen Fls drooping, in many-flowered racemes Fruit $\frac{3}{4}$, velvety. Japan. (Fig. 104 E.)

SYMPLOCOS PANICULATA (S CRATAEGOIDES) 30 May D Branches slender, spreading Ls. alternate, ov, 3, pointed, sharply toothed, conspicuously veined and downy below. Fls $\frac{1}{4}$, white, fragrant, in dense terminal or axillary panicles, K (5), C (5), A ∞ , \bar{G} (2), stamens in five bundles. Fruit $\frac{1}{4}$, egg-shaped, blue, containing a 1-seeded stone. Himalaya to Japan (Fig 103 J)

Family 66 OLEACEAE. K (4), C (4–6) or 0, A 2, \bar{G} (2)

ABELIOPHYLLUM DISTICHUM 3. May. D Branchlets with chambered pith. Ls opposite ov, 3, entire, hairy, short-stalked, in two opposite rows. Fls. $\frac{1}{4}$, white, in small axillary racemes. Fruit 1, flat, winged Corea. (Fig. 70 C.)

CHIONANTHUS. Fringe Tree. Ls. opposite or sub-opposite, ov., entire, tapering base. Fls. white, with four strap-shaped petals; in loose panicles. Fruit a dark blue 1-seeded berry.

C. retusa. Chinese Fringe Tree. 30. June. D. Ls. ov., 4, pointed, blunt or notched at end. Petals $\frac{3}{4}$. China and Japan.

C. virginica. Fringe Tree. 30. June. D Ls ov., oblong, 8, pointed. Petals 1 long. East United States. (Fig. 69 A.)

FONTANESIA PHILLYREOIDES. 10. June. D. Branchlets 4-angled. Ls. opposite ov., lanc., 2, entire, pointed, hairless. Fls. very small, greenish white, in terminal panicles. Fruit $\frac{1}{4}$, dry, flat, winged, 2-seeded. Asia Minor. (Fig. 69 B.)

FORESTIERA (ADELIA) ACUMINATA 25 April-May D Ls opposite, ov., lanc., 3, finely and distantly toothed at outer end, wedge-shaped base, light green, short-stalked Fls. very small, greenish, without petals, appearing before leaves in small clusters or racemes, often unisexual. Fruit $\frac{1}{2}$, a narrow-oblong dark purple berry. U S A.

FORSYTHIA Golden Bell Branchlets 4-angled, hollow or with chambered pith, hairless Ls opposite, simple or 3-fol., ov., lanc., toothed in outer half, hairless. Fls. 1, yellow, solitary or in pairs in 1-axils, appearing before the ls. Fruit a dry capsule

F. intermedia 10. March-April D. Branchlets arching or spreading; pith solid at joints, often chambered between Ls simple or 3-fol., 5 Hybrid.

Variety *densiflora*. Fls. densely crowded on branchlets

Variety *spectabilis* Larger, deeper yellow and more numerous fls

F. suspensa 10 March-April D Branches arching, drooping or rambling; pith solid at joints, never chambered between Ls 4, mostly simple. China (Fig 60 A)

F. viridissima 8. March-April. D. Branches stiff, erect, with chambered pith. Ls simple, lanc., 6 China

FRAXINUS Ash. Buds usually black or scurfy brown Ls opposite, pinnate; lflets. toothed Fls. small, in panicles Fruit dry, 1-winged, 1-seeded.

(a) *Fls. white, 4-petalled, in terminal panicles*
appearing after ls. (Flowering Ash Section)

F. Mariesii 20. June. D. Ls 5-fol.; lflets ov., 3, distantly and shallowly toothed, stalkless, lowest pair much the smallest, common stalk grooved, swollen and purple at base Fruit 1, deep purple in July. Central China. (Fig. 8 c.)

F. Ornus. Manna Ash. 65 May D. Buds brown. Ls. 7-9-fol., lflets. ov., 4, short-pointed, shallowly round-toothed, common stalk grooved. Fruit 1. Asia Minor. (Fig. 8 B.)

F. Paxiana 65. June D. Buds rusty-downy. Ls 7-9-fol.; lflets. lanc., 6, distantly and shallowly round-toothed, long-pointed, hairless, stalkless; common stalk grooved Fruit 1. China.

F. Spaethiana. 50. June. D Ls 5-9-fol.; lflets. ov., lanc., 8, unequal-sided at base, coarsely round-toothed, long-pointed, hairless, stalkless; common stalk slightly grooved on upper side, very much swollen at base and clasping stem. Fruit 1 $\frac{1}{2}$ Japan.

(b) *Fls. without petals, in small lateral panicles*
appearing before ls.

F. americana White Ash. 120. April. D. Branchlets shining dark green or brownish. Ls. 5-9-fol.; lflets. lanc., 6, distantly toothed in outer half or entire, long-pointed, whitish below, stalked; common stalk yellowish white, not grooved Fruit 2, wing starts at end of seed, calyx persistent. North America.

F. angustifolia. Narrow-leaved Ash. 70. April. D. Buds dark brown Ls.

FRAXINUS—continued

9-13-fol, lfts lanc, 3, jaggedly toothed, hairless, stalkless; common stalk grooved. Fruit 1, calyx deciduous South Europe and North Africa

F. excelsior Common Ash. 140. April D. Buds black Ls 9-13-fol, lfts. lanc, 4, evenly and distantly toothed, stalkless, common stalk grooved Fruit $\frac{1}{2}$, hanging in large bunches. Sexes often on different trees Europe (including Britain) and North Africa. (Fig 8 A)

JASMINUM. Jasmine Ls or lfts entire Fls yellow or white, rarely pink, corolla tubular with four to nine spreading lobes, solitary or in pairs or branched clusters Fruit a black berry.

(a) *Ls. opposite, simple; fls pink*

J. Beesianum. 3. June-July D Semi-climber Branchlets green, angular Ls. ov, 2, pointed, slightly downy on both sides Fls. $\frac{3}{4}$, solitary or in 2-3-flowered terminal clusters, sepals linear. China. (Fig 69 c)

(b) *Ls. opposite, compound*

J. nudiflorum. Winter Jasmine 15 November-February D. Rambler. Branchlets angled, long, slender and drooping. Ls 3-fol, short-stalked; lfts. ov., 1, rough or hairy near margins, stalkless. Fls. $\frac{3}{4}$, yellow, 6-lobed, solitary in l.-axils, sepals linear. China and Japan. (Fig 1 F.)

J. officinale. Common Jasmine, Jessamine. 20. June-October. D. Climber Stems very slender, angled, hairless. Ls pinnate, 5-9-fol; lfts. ov., 2, downy near margins, lateral ones stalkless Fls $\frac{3}{4}$, white, fragrant, 4-5-lobed, in terminal branched clusters, sepals linear. Persia and North-west India. (Fig. 9 A.)

Variety *affine* (*J. grandiflorum*) Larger fls, with purple tinge.

Variety *folius aureis* Ls. golden yellow.

* *J. pruinulimum*. Primrose Jasmine 10. January-March. E Rambler Ls. 3-fol.; short-stalked, lfts. lanc., 3, dark glossy green, short-stalked. Fls $1\frac{1}{2}$, yellow, 6-10-lobed, solitary, sepals short, lanc China (Fig 1 G)

(c) *Ls. alternate, compound*

J. fruticans. 15. June-September. $\frac{1}{2}$ E. Stems angled. Ls 3-fol; lfts lanc., $\frac{1}{2}$, edged with small hairs. Fls. $\frac{1}{2}$, yellow, calyx bell-shaped, 5-lobed, in 3-5-flowered clusters at end of side twigs. Mediterranean region.

J. Giraldii. 8 May-June. E. Stems angled Ls. 3-fol.; lfts. lanc., terminal one up to 4, lateral ones much smaller, wrinkled above, downy below Fls. $\frac{3}{4}$, yellow, not fragrant, in terminal branched clusters, sepals triangular. China.

J. Parkeri. 1. June. E. Stems grooved. Ls. 3-fol. or pinnate; lfts. 1, stalkless. Fls. $\frac{3}{4}$, yellow, solitary, calyx cup-shaped. North-west India.

J. revolutum 6 June-August $\frac{1}{2}$ E Stems slightly angled. Ls. 3-fol. or pinnate; terminal lfts. 2, dull dark green above. Fls. 1, yellow, fragrant. North-west Himalaya. (Fig 12 B.)

J. Wallichianum. 6. June-August. $\frac{1}{2}$ E. Like *J. revolutum*, but ls. 7-13-fol; lfts. lanc., 1. Nepal.

LIGUSTRUM. Privet. Ls. opposite, entire, short-stalked. Fls. small, white, tubular, in conspicuous terminal panicles. Fruit a black berry.

LIGUSTRUM—continued

(a) Tube of corolla scarcely longer than lobes

L. japonicum Japanese Privet 8. July–September. E. Ls. ov., 4, very glossy, blackish green, veins raised, margin and midrib reddish. Fls. in large panicles up to 8 long. China and Japan.

Variety *coriaceum*. Ls. roundish ov., 2, blunt or notched at apex. Fl-panicles up to 3 long

L. lucidum 30. August–October E Ls. ov., 6, long-pointed, glossy green above, hairless, veins sunk, margins translucent Fls. in large panicles up to 8 long China (Fig. 70 B)

Variety *aureo-variegatum* Ls. variegated with yellow

L. sinense Chinese Privet. 20 July. D. or $\frac{1}{2}$ E. Branchlets densely downy. Ls. ov., 3, pale green, thin, blunt or notched at apex. Fl-panicles up to 4 long. China (Fig. 70 H)

L. vulgare Common Privet 10. June–July. D. or $\frac{1}{2}$ E. Ls. ov., lanc., 2, hairless Fl-panicles up to 2 long Europe (including Britain) and North Africa (Fig. 70 A)

(b) Tube of corolla much longer than lobes

L. ionandrum 10 June E. Branchlets downy, greyish. Ls. ov., 1, hairless. Fl-panicles dense, up to 1 long; stamens violet. China. (Fig. 70 E.)

L. ovalifolium. 15. July E Branchlets hairless Ls. ov., 2, glossy green, hairless Fl-panicles up to 4 long. Japan. (Fig. 70 G)

Variety *argenteum*. Ls. bordered with white.

Variety *aureum* Golden Privet. Ls. yellow except in centre.

L. Prattu (*L. Delavayanum*) 6 June–July E. Branchlets densely downy. Ls. ov., 1, hairless. Fl-panicles up to 2 long. China. (Fig. 70 F.)

OLEA. Ls. opposite, pitted. Fls. small, white, in axillary racemes. Fruit $\frac{3}{4}$, egg-shaped, oily, containing one hard stone.

* *O. europaea* Olive. 40. May. E. Ls. ov., lanc., 3, entire, leathery, dark dull green above, silvery or pale green below, sometimes downy on both sides. South Europe and West Asia. (Fig. 69 D.)

* *O. fragrans*. 50 May E. Ls. ov., 6, finely toothed or entire, bright yellowish green below Fls. very fragrant. Japan. (Fig. 59 J.)

OSMANTHUS. Ls. opposite, mostly spine-toothed, hairless. Fls. small, white or yellowish, fragrant, in small clusters. Fruit a dark blue berry.

• *O. Aquifolium*. 20. September–October. E. Ls. ov., $2\frac{1}{2}$, holly-like with two to four large spiny teeth on each side, glossy green above. Fls. $\frac{1}{4}$, in short-stalked axillary clusters. Japan. (Fig. 54 B.)

Variety *purpureus*. Young stems black; ls. purple.

Variety *variegatus*. Ls. bordered with white or yellow.

O. armatus. 15. September E. Ls. lanc., 6, long-pointed, base rounded or heart-shaped, coarsely spine-toothed, prominently net-veined. Fls. $\frac{1}{4}$, in axillary clusters. China. (Fig. 54 C.)

O. Delavayi. 10. April–May. E. Ls. ov., 1, sharply toothed, minutely dotted

OSMANTHUS—*continued*

below. Fls. $\frac{1}{2}$, tubular with four spreading lobes, in terminal and axillary clusters China (Fig. 54 D)

O. Fortunei. 20. September E Ls ov, 4, holly-like with six to ten spiny teeth on each side. Fls. $\frac{1}{4}$, very fragrant, in axillary clusters. Hybrid (Fig. 54 A)

O. serrulatus. 12 April–May. E Ls. lanc., 4, base tapering, finely toothed, leathery, dotted below Fls. $\frac{1}{2}$, in axillary clusters China (Fig. 59 K.)

PARASYRINGA (LIGUSTRUM, SYRINGA) SEMPERVIRENS 6 June–July E. Ls opposite, broad-ov. or circular, $1\frac{1}{2}$, leathery, glossy, hairless. Fls. small, white, tubular, in terminal spikes Fruit splitting into two China (A genus intermediate between privet and lilac) (Fig. 70 L)

PHILLYREA Jasmine Box Ls opposite, hairless, short-stalked. Fls. small, white or greenish, in axillary clusters, stamens protrude beyond corolla. Fruit a blue-black berry.

P. angustifolia 10. May E. Ls linear, 2, entire, dark green, hairless, pitted below Mediterranean region (Fig. 52 M)

P. decora. 10. April. E. Ls. ov., lanc, 5, entire, very hard and firm with bevelled edges. Mediterranean region. (Fig. 70 J)

P. latifolia 30. April–May. E. Ls ov, sharply toothed Mediterranean region. (Fig. 60 J)

SYRINGA. Lilac. Ls opposite, entire, lobed, or pinnate. Fls. small, lilac, purple, or white Fruit an oblong leathery capsule.

(a) *Tube of corolla scarcely longer than calyx*

S. japonica Japanese Lilac. 30. June–July. D Ls ov., 6, bright green above, downy below, rounded or heart-shaped base. Fls. white, in panicles up to 12 long, stamens with long filaments. Japan

S. pekinensis 12 June. D. Ls. ov, lanc, 4, dark green above, greyish below, tapering base. Fls. white, in loose panicles up to 6 long, stamens with long filaments China

Variety *pendula* Branches drooping.

(b) *Tube of corolla much longer than calyx*

S. chinensis. Rouen Lilac. 15 May. D. Ls. ov, lanc., 3, tapering base. Fls. purplish, in long drooping panicles. Hybrid.

Variety *alba*. Fls. white.

S. emodi. Himalayan Lilac. 15. June. D. Branchlets dark olive-green spotted with white. Ls. ov., 8, tapering base, whitish below Fls. white or purplish, in panicles up to 6 long, not fragrant. Himalaya (Fig. 69 F.)

Variety *variegata*. Ls. margined with yellow.

S. josikaea. Hungarian Lilac. 9. June D. Ls ov, 4, dark green above, whitish below, rounded base. Fls. deep violet, slightly scented, in narrow panicles up to 6 long. Transylvania.

S. persica. Persian Lilac. 6. May. D. Ls. lanc., 2, tapering base. Fls. purple, in small panicles up to 3 long. Afghanistan. (Fig. 69 G.)

Variety *alba*. Fls. white.

Variety *laciniata*. Ls. cut into parallel lobes. (Fig. 34 E.)

SYRINGA—continued

S. pinnatifolia Pinnate Lilac 8 May D. Ls pinnate; lfts ov., lanc, $1\frac{1}{2}$, stalkless, terminal ones often attached to common stalk by part of blade. Fls. white, in small panicles up to 3 long. China. (Fig 8 E)

S. reflexa 9. June D Ls ov., lanc., 8, tapering base Fls deep pink, in narrow drooping panicles up to 8 long China

S. villosa 10 May–June D. Ls ov, lanc, 6, rounded or tapering base, scattered hairs below Fls. lilac-rose, in large terminal and axillary panicles up to 10 long China (Fig. 69 H)

S. vulgaris Common Lilac 20 May. D Ls. ov, 6, rounded or heart-shaped base, hairless. Fls lilac, fragrant, the panicles in pairs from terminal buds. East Europe (Fig 69 E)

Variety *alba* Fls. white Winter buds yellowish green.

Variety *purpurea*. Fls purple Winter buds brown.

Many other varieties in cultivation, with fls. of varying shades of colour from white to deep purple

Family 67. APOCYNACEAE. K (5), C (5), A₅, G (2)

Climbing or trailing plants. Stems with milky juice. Ls opposite, entire, hairless, midrib and veins rather broad. Fls. showy, twisted in bud.

* *MANDEVILLA SUAVEOLENS*. 12. June–September. D Climber. Stems hollow, hairless. Ls ov, 3, long-pointed, heart-shaped, tufts of white down in vein-axils below, long-stalked Fls. $1\frac{1}{2}$, white, funnel-shaped, fragrant, in branched axillary clusters Fruit 12, of two narrow cylindrical seed-pods, seeds bearded. Argentine. (Fig 76 D)

TRACHELOSPERMUM Climbers with hairy stems Ls. glossy dark green, blunt-ended. Fls. 1, white, fragrant, in terminal branched clusters.

* *T. divaricatum* (*T. crocostomum*). 15. July–August E Ls ov., 2. Fls. with erect sepals. East Asia.

* *T. (Rhynchospermum) jasminoides*. 12 July–August. E. Ls. lanc., 3. Fls. with reflexed sepals. China and Japan. (Fig 77 D.)

VINCA. Periwinkle. Barren stems trailing, flowering ones erect. Ls. ov., glossy, hairless. Fls. blue.

V. major. Greater Periwinkle. 2. April. E. Ls 3 Fls. $1\frac{1}{2}$, with linear sepals. Europe (including Britain) and West Asia. (Fig 77 A.)

V. minor. Lesser Periwinkle. $\frac{1}{2}$. April. E. Ls. 2. Fls. 1, with lanc sepals. Europe (including Britain) and West Asia.

Variety *argenteo-variegata* Ls. blotched with white.

Variety *aureo-variegata*. Ls. blotched with yellow.

Family 68. ASCLEPIADACEAE. K (5), C (5), A (5), G (2)

Climbers. Stems with milky juice, twining. Ls. opposite, entire. Seed-pod large, seeds with tufted hairs.

* *ARAUJIA SERICOFERA* (*PHYSIANTHUS ALBENS*). 20. July. E. Ls. ov., lanc., 4, pointed, square-cut at base, pale green above, minutely felted below. Fls. $\frac{1}{2}$,

white, fragrant, tubular with spreading lobes, in few-flowered racemes at joints of stem. Fruit 5×3 , grooved. Brazil (Fig 76 H)

MARSDENIA ERECTA (CYANCHUM ERECTUM) 20 July D Ls ov, 2, heart-shaped base, pointed, pale glaucous green. Fls. $\frac{1}{4}$, white, fragrant, in terminal and axillary branched clusters. Fruit 3, cone- or spindle-shaped, pointed. Asia Minor. (Fig 76 E)

METAPLEXIS JAPONICA (M. STAUNTONII). 20 July–September D Ls ov, 4, heart-shaped base. Fls. $\frac{1}{2}$, pinkish, bell-shaped, with reflexed sepals. Fruit 4, spindle-shaped. China and Japan.

PERIPLOCA GRAECA. Silk Vine. 30. July–August. D. Ls ov, 4, veins parallel ending in marginal vein. Fls. 1, greenish outside, brownish purple inside, in branched clusters at end of short side shoots. Seed-pods 5, in pairs usually joined at ends. South-east Europe and Orient. (Fig 76 F)

Family 69. LOGANIACEAE K (4–5), C (4–5), A4–5, G (2)

Ls. stipulate.

BUDDLEIA Butterfly Bush. Stems usually ribbed or angled. Ls. usually opposite, short-stalked. Fls. small, tubular or bell-shaped, in small clusters grouped together in spikes or panicles. Fruit a dry capsule.

(a) *Ls. alternate*

B. alternifolia 20 June. D. Branchlets arching or drooping. Ls. lanc., 4, pointed, tapering base, dull dark green above, glaucous below. Fls. lilac purple, in clusters on old wood. China (Fig. 125 A.)

(b) *Ls. opposite; stems winged at angles*

B. japonica 5 July. D. Stems 4-angled. Ls. lanc., 8, minutely and distantly toothed, dark green above, tawny-felted below. Fls. pale lilac, in terminal drooping spikes. Japan.

B. Lindleyana. 6. July–August. D. Stems 4-angled, hairless. Ls. ov., lanc., 4, tapering base, coarsely toothed, hairless. Fls. purplish violet, in upright spikes. Japan. (Fig. 57 B.)

(c) *Ls. opposite; stems not winged*

* *B. auriculata*. 8. August–September. D. Branchlets cylindrical. Ls. ov, lanc, 3, distantly toothed in outer half, bright green and somewhat wrinkled above, white- or rusty-felted below, about five pairs veins. Fls. orange-yellow, in axillary racemes at end of shoots. South Africa (Fig. 57 D.)

B. Colvillei. 40. June–September D. Branches arching or drooping, covered with reddish wool when young. Ls. lanc., 10, shallowly toothed, tapered at both ends, dark green above, felted below. Fls. crimson, in large terminal panicles. East Himalaya. (Fig. 57 G)

* *B. Fallowiana*. 8. August–September. D. Young stems white-felted. Ls. lanc., 8, long-pointed, wedge-shaped base, shallowly toothed, white-felted below. Fls. pale lilac, in long terminal panicles. China.

* *B. Farreri*. 10. May. D. Young stems white-felted. Ls. ov., lanc., 12,

BUDDLEIA—continued

unevenly toothed, straight or heart-shaped base, dull dark green above, white-felted or woolly below Fls rose-lilac, in clusters on old wood. China (Fig 57 E.)

B. globosa Orange Ball Tree. 15 June. $\frac{1}{2}$ E. Young stems tawny-felted. Ls lanc, 8, tapered at both ends, round-toothed, dark green and wrinkled above, tawny-felted below. Fls yellow, in balls $\frac{3}{4}$ diameter. South America. (Fig 57 H)

B. nivea 9 July–August D. Young stems covered with white wool. Ls ov., lanc, 10, rounded at base, coarsely toothed, white-felted below. Fls pale purple, in terminal spikes. West China

B. paniculata. 15 June–September D Like *B. Farreri*, but ls lanc, 4; and fls. lilac, with white throat, fragrant, in pyramidal panicles up to 3 long. Himalaya

* *B. salvifolia*. South African Sage Wood. 15. July. $\frac{1}{2}$ E. Stems covered with white or reddish down. Ls. lanc, 3, minutely round-toothed, dull green and wrinkled above, white- or brown-felted below. Fls white or pale lilac, woolly, in terminal panicles on current year's wood. South Africa (Fig. 57 C)

B. variabilis (*B. Davidn*) 15. June–September. D. Branchlets 4-angled, downy. Ls. lanc, 12, long-pointed, finely toothed, white-felted below. Fls lilac or purple with orange eye, in long narrow spikes up to 12. China. (Fig. 57 F.)

Variety *magnifica* Fl. spikes violet-purple, up to 30 long; corolla lobes reflexed.

Variety *Veitchiana* Like above, but corolla lobes erect; comes into flower a little earlier (Bean)

Variety *Wilsoni*. Fls rosy lilac with deep orange centre, corolla lobes erect.

* *DESFONTAINEA SPINOSA*. 10. July–October. E Branches smooth, shining. Ls. opposite, ov., 2, leathery, glossy, margins armed with sharp triangular spines. Fls. $1\frac{1}{2}$, funnel-shaped, red, with yellow lobes South America. (Fig. 54 G.)

Family 70. BORAGINACEAE. K (5), C (5), A₅, G̅ (2)

(*Anchusa*, Forget-me-not)

Fruit of four nutlets.

EHRETIA. Ls alternate, ov, 7, toothed Fls. $\frac{1}{4}$, white, in terminal panicles. Fruit berry-like.

. *E. acuminata* (*E. thyrsoflora*). 20. June–July. D. Ls. hairless or nearly so. North India, China, and Japan. (Fig. 104 L.)

E. macrophylla. 20. June–July. D. Ls. hairy. Himalaya.

LITHOSPERMUM PROSTRATUM. Gromwell. $\frac{1}{2}$. May. E. Stems slender, trailing, bristly. Ls. alternate, linear-oblong, $\frac{3}{4}$, blunt-ended, bristly. Fls. $\frac{1}{2}$, blue, funnel-shaped, stalkless, in terminal spikes. Europe. (Fig. 52 J.)

MOLTKIA PETRAEA. 2. June. $\frac{1}{2}$ E. Stems erect, hairy. Ls. alternate, linear, 1, hairy. Fls. $\frac{1}{4}$, violet-blue, tubular, in crowded terminal clusters. Dalmatia. (Fig. 51 E.)

Family 71 *CONVOLVULACEAE*. K (5), C (5), A₅, G (2)

* *CONVOLVULUS CNEORUM* (C *ARGENTEUM*) 3 May–August E Whole plant covered with silky hairs Ls alternate, lanc, 2, entire, tapered at base. Fls 1½, white or pinkish, trumpet-shaped, in a terminal cluster Fruit a pod splitting into four South Europe. (Fig 125 D)

† Family 72 *SOLANACEAE*. K (5), C (5), A_{2–5}, G (2)
(Potato, Tomato)

CESTRUM Ls alternate, lanc, 5, short-stalked Fls. fragrant at night, in axillary or terminal panicles. Fruit a berry cupped in persistent calyx.

* *C. elegans* (C *fasciculatum*) 8 June–July. D. Rambler. Ls hairy Fls. ¾, rosy crimson. Mexico (Fig. 125 K)
Variety *Newellii*. Fls. larger.

* *C. Parqui* (C. *virgatum*) 8 June–July. D Ls. hairless Fls 1, yellowish green. Chile (Fig. 125 L.)

FABIANA. False Heath. Ls alternate, minute, scale-like, completely covering branchlet. Fls ¾, tubular, solitary at end of side shoots. Fruit a capsule.

* *F. imbricata*. 8 June. E. Narrow habit of growth. Fls. white. South America. (Fig. 49 C)

* *F. violacea*. 12. June E. Spreading habit of growth. Fls pale mauve or pale blue. South America.

LYCIUM Box Thorn Ramblers. Branches with a few spines Ls alternate or in clusters, ov., lanc., short-stalked Fls. ½, solitary or in few-flowered clusters in 1-axils. Fruit a red berry.

L. chinense (L. *barbarum*). Chinese Box Thorn, Cottage Tea Tree. May–July. D. Ls. 4. Fls. purple. China. (Fig. 125 E.)

L. pallidum. Fremont's Box Thorn. June–July. D. Ls. 2. Fls greenish white. South United States.

SOLANUM. Climbers or ramblers. Ls. alternate, entire. Fls. blue, purple, or white, with conspicuous yellow stamens, solitary or in branched clusters in 1-axils. Fruit a berry.

* *S. crispum* Potato Tree. 10. June–September. ½ E. Ls. ov., lanc, 5, pointed, tapering or rounded base. Fls. 1, blue. Chile. (Fig 125 B.)

S. Dulcamara. Woody Nightshade, Bittersweet. 8 July–September. D. Ls. ov., 4, heart-shaped at base, often 3-fol. or 3-lobed, pointed, bright green. Fls purple, drooping. Berry red. Europe (including Britain). (Fig. 125 F.)

* *S. jasminoides*. 10. July–September. ½ E. Ls. deeply lobed or pinnate, 3. Fls. pale blue. Brazil. (Fig. 12 C.)
Variety *album*. Fls. white.

* *STREPTOSOLEN JAMESONII*. 6. June–July. D. Ls. alternate, ov., 2, thin, rough above, downy below. Fls. 1, orange-red, tubular (tube twisted), A₄, in pairs of different lengths, in terminal clusters. Fruit a capsule. South America. (Fig. 125 C.)

† Family 73 *SCROPHULARIACEAE*. K (4-5), C (4-5), A2-4, G (2)
(Antirrhinum, Foxglove)

Fls. usually of irregular shape.

* *BOWKERIA GERRARDIANA* 10 August E Stems hairy Ls in threes, ov., lanc, 7, toothed, long-pointed, downy, stalkless. Fls. $\frac{3}{4}$ (like *Calceolaria*), white, 2-lipped, in 3-10-flowered branched clusters South Africa. (Fig 55 A)

CALCEOLARIA Ls opposite, ov., toothed. Fls $\frac{1}{2}$, 2-lipped, pouches, in terminal branched clusters

* *C integrifolia* 4 July-August E Branchlets velvety. Ls ov, 3, tapered at both ends, minutely round-toothed, dull green and wrinkled above, grey-felted below Fls yellow Chile (Fig 56 O)

* *C. violacea* 6 July-August. $\frac{1}{2}$ E. Branchlets minutely downy. Ls. ov., 1, pointed, coarsely and unevenly toothed, hairy. Fls. pale violet, helmet-shaped. Chile

* *DIPLACUS GLUTINOSUS* 6 June-August E Stems clammy Ls. opposite, lanc, 4, tapered at base, minutely toothed in outer half, glossy above, slightly downy below, short-stalked or stalkless Fls 1, yellow or orange, trumpet-shaped, solitary in 1-axils. Seed-pod $\frac{1}{2}$, slender, ribbed. California (Fig 62 J)

* *FREYLINIA CESTROIDES*. 12. October-November. E. Ls. opposite, linear, 5, hairless, midrib prominent below. Fls. $\frac{1}{2}$, creamy yellow, tubular, in terminal panicles. South Africa. (Fig 50 H.)

PAULOWNIA. Ls opposite, ov., 12, heart-shaped base, sometimes 3-5-lobed, hairy or downy, long-stalked. Fls. large, like a foxglove, in large terminal panicles. Fruit a dry egg-shaped pointed capsule containing numerous winged seeds.

P. Fargesii. 70. June. D. Branchlets and l.-stalks clammy. Ls downy below. Fls. 3, pale lilac with yellow in throat. China

P. imperialis (*P. tomentosa*). 50. May-June. D. Ls. velvety above, woolly below. Fls. 2, purple. Japan (Fig. 26 c.)

PENTSTEMON. Beard Tongue. Semi-herbaceous. Ls. opposite, toothed, stalkless or nearly so. Fls. large, tubular, 2-lipped, in terminal racemes or panicles. Fruit a dry capsule.

* *P. cordifolius*. 2. July-August. E. Ls. heart-shaped, 2, coarsely toothed. Fls. $1\frac{1}{2}$, scarlet, in large panicles. California. (Fig. 56 K.)

* *P. heterophyllus*. 5. July-September. D. Ls linear, lanc., 2, tapering base. Fls. 1, purple, in narrow racemes. California. (Fig. 52 O.)

P. Menziesii. 1. May-June. D. Ls. ov., $\frac{3}{4}$, finely toothed, blunt-ended, tapering base. Fls. 1, purple. California. (Fig. 56 L.)

P. Scouleri. $1\frac{1}{2}$. July-August. D. Ls. linear, lanc., 2, pointed, tapered at both ends, toothed. Fls. 1, lilac-purple, in 5-11-flowered racemes. West North America. (Fig. 52 N.)

PHYGELIUS CAPENSIS. Cape Figwort. 6. September. D. Semi-herbaceous. Stems erect, stout, angled, very pithy, hairless. Ls. opposite, ov., 5, blunt-toothed, hairless; l.-stalk 1, with pair of small wings at base. Fls. 1, scarlet, tubular, in large terminal erect panicles. South Africa. (Fig. 57 A.)

VERONICA (HEBE). Shrubby Speedwell. Stem conspicuously ringed with scars of fallen ls. Ls. opposite, in four distinct rows, very shortly stalked or stalkless. Fls. small, blue, purple, or white, in terminal or axillary spikes or racemes, K (4), C (4), A₂. Fruit a dry flattened capsule.

(a) *Ls. minute, scale-like*

- V. cupressoides* (*V. salicornioides*) 3. July–August. E. L-pairs distinct. Fls. pale blue, in small heads. New Zealand (Fig. 49 J).
V. Hectori. 2. July–August. E. L-pairs overlapping, completely concealing stem. Fls. white or pinkish, in small terminal heads. New Zealand (Fig. 49 Q).
V. loganoides. $\frac{3}{4}$. June–July. E. Young stems hairy. Ls. keeled, often toothed, dull green, hairless. Fls. white, in a terminal 1-3-branched raceme; fl.-stalks and sepals hairy. New Zealand.
V. lycopodioides (*V. selaginoides* ?) 2. June–July. E. Ls. keeled, giving 4-sided appearance to branchlet. Fls. white, with large blue stamens, in small terminal heads. New Zealand (Fig. 49 K).

(b) *Adult l 1 inch or less in length*

- V. amplexicaulis*. 3. July–August. E. Ls. heart-shaped, 1, not keeled, blunt-ended, green or glaucous, crowded. Fls. $\frac{1}{4}$, white, stalkless, in axillary spikes. New Zealand. (Fig. 66 K).
V. anomala. 5. July–August. E. Ls. lanc., pointed. Fls. $\frac{3}{4}$, white or pinkish, in a cluster of spikes at end of shoot. New Zealand. (Fig. 66 J).
V. Balfouriana. 3. July. E. Stems erect, purplish. Ls. ov., $\frac{3}{4}$, pale glossy green. Fls. $\frac{1}{2}$, purplish blue, in axillary racemes. New Zealand.
V. buxifolia. 4. June–August. E. Ls. ov., $\frac{1}{2}$, pointed, keeled, dark glossy green. Fls. $\frac{1}{4}$, white, in closely packed clusters at end of shoot. New Zealand. (Fig. 66 L).
V. carnosula. 1. July–August. E. Ls. ov., $\frac{1}{2}$, pointed, keeled, dark glossy green. Fls. $\frac{1}{4}$, white, in a terminal cluster of dense spikes. New Zealand.
V. Colensoi. 2. July–August. E. Ls. ov., lanc., pointed, greyish green, 3-nerved, occasionally toothed, crowded. Fls. $\frac{1}{4}$, white, in axillary racemes. New Zealand. (Fig. 66 G).
V. elliptica (*V. decussata*). 15. July–August. E. Ls. ov., 1, minutely pointed, keeled, white down on margins, rounded or straight base. Fls. $\frac{3}{4}$, white with purple lines, in 4-12-flowered racemes up to 1½ long. Falkland Islands.
V. glauco-coerulea. $\frac{1}{2}$. June–August. E. Stems downy. Ls. ov., $\frac{1}{2}$, grey or glaucous. Fls. $\frac{1}{4}$, blue-purple, stalkless, in axillary or branched spikes. New Zealand.
V. pinguiifolia. 3. July–August. E. Ls. ov., blunt-ended, concave, grey-green. Fls. $\frac{1}{4}$, white, in axillary spikes. New Zealand. (Fig. 66 D).
V. Traversii. 6. July. E. Ls. lanc., pointed, tapering base, dull pale green. Fls. $\frac{1}{4}$, white, in axillary racemes. New Zealand. (Fig. 66 E).
V. vernicosa. 2. June–August. E. Ls. ov., 1, pointed, dark glossy green, 3-nerved. Fls. $\frac{1}{4}$, white, racemes in pairs. New Zealand.

VERONICA (HEBE)—continued

(c) *Adult l. more than 1 inch long*

- V. angustifolia* 5 July–September. E Ls linear, 3, pointed, often directed downwards. Fls $\frac{1}{4}$, white tinged with lilac, racemes in axillary pairs New Zealand (Fig 50 J)
- * *V. Hulkeana* 6. May–June E L-pairs somewhat distant. Ls ov., 2, coarsely toothed, dark glossy green Fls $\frac{1}{4}$, lilac, in large terminal panicles. New Zealand. (Fig 59 L)
- V. salicifolia*. 10. June–August (in mild districts throughout the year). E Ls lanc, 5, pointed, pale green. Fls. $\frac{1}{4}$, bluish purple, in cylindrical racemes New Zealand (Fig 66 F)
- Variety *serrulata*. Ls distantly toothed.
Many other varieties in cultivation
- V. speciosa* 5 July–September E Branches stout, spreading Ls. ov., 4, blunt-ended, concave Fls $\frac{1}{4}$, dark reddish purple, in axillary racemes, New Zealand. (Fig 66 H)
- Many varieties in cultivation.

Family 74. GESNERACEAE. K (5), C (5), A4, G (2)

* MITRARIA COCCINEA. Mitre Flower. Prostrate or climbing. May–June E. Stems slender, downy. Ls opposite, ov, 1, pointed, toothed, dark glossy green above, short-stalked. Fls. 1, scarlet, tubular, solitary on slender downy stalk. Fruit an egg-shaped berry Chile (Fig. 56 H)

Family 75. BIGNONIACEAE. K (3–5), C (5), A4, G (2)

Ls. opposite. Fls. large and showy, funnel-shaped, tubular, often irregularly shaped.

BIGNONIA CAPREOLATA. Cross Vine. 50. June. E. Climber. Ls 2-fol.; common stalk $\frac{1}{2}$, ending in tendril, lflets. lanc., 5, pointed, entire, heart-shaped base, deep green, hairless. Fls. 1, orange-red, in axillary clusters. Fruit 6, slender, flattened. South-east United States. (Fig. 6 c.)

CATALPA. Ls. large, opposite or in threes, ov., pointed, 3–5-nerved at base, often lobed, long-stalked. Fls. large, bell-shaped with five spreading lobes, in large terminal panicles. Seed-pod cylindrical narrow, up to 24 long.

C. bignonioides. Indian Bean Tree. 50. July. D. Ls 8, short-pointed, unpleasant smell when crushed. Fls. $1\frac{1}{2}$, white spotted with yellow and purple. East United States (Fig. 25 E.)

C. Fargesii. 30. July. D. Ls. 6, long-pointed, hairy below, not odorous when crushed. Fls. $1\frac{1}{2}$, pinkish spotted with brown and red. China.

C. speciosa. Western Catalpa. 100. July. D. Ls. 12, long-pointed. Fls. 2, spotted with yellow and purple. U.S.A.

ECCREMOCARPUS SCABER. Climber. June–September. D. Stems herbaceous, ribbed, hairless. Ls. opposite, 2-pinnate, main stalk ending in tendril; lflets. ov., 1, unevenly toothed or lobed, hairless. Fls. 1, orange-red, tubular, nodding, in

7-12-flowered racemes. Seed-pod $1\frac{1}{2}$, egg-shaped, flattened on one side, seeds flat, winged. Chile. (Fig 21 D)

* *PITHECOCTENIUM MURICATUM* Climbing by tendrils Stems ribbed. Ls opposite, 3-fol or middle lft replaced by tendril; lflets ov., 2, pointed, rounded or slightly heart-shaped base Fls 1, trumpet-shaped, white with yellow throat, in terminal, many-flowered racemes. Fruit oblong, 5, prickly Mexico. (Fig 1 H.)

TECOMA (CAMPSIS). Climbing by aerial roots which occur in tufts at joints. Ls. opposite, pinnate, lflets ov., 3, toothed, stalkless. Fls 3, orange-red, trumpet-shaped, in terminal clusters or panicles Seed-pod 4, elongated, with numerous winged seeds

T. grandiflora 30 August–September D Aerial roots few or none Lflets hairless. Fls. in terminal drooping panicles. China and Japan

T. radicans (Bignonia radicans). Trumpet Flower 30 August–September D. Aerial roots numerous Lflets hairy on midrib and veins below. Fls. in terminal clusters. North America. (Fig. 9 c)

Family 76. *GLOBULARIACEAE* K (5), C (5), A₄, G₁

GLOBULARIA CORDIFOLIA Globe Daisy $\frac{1}{4}$ May–August Ls. obov., 1, toothed or notched at apex, mostly spreading radially at ground-level. Fls. small, blue, 2-lipped, in round heads $\frac{1}{2}$ across on the top of erect stalks Alps, Tyrol, and mountains of South Europe. (Fig. 103 H.)

Family 77. *VERBENACEAE*. K (4-5), C (4-5), A₄, G (2)

CALLICARPA. Ls. opposite, 5, ov., lanc., toothed, pointed, base tapering. Fls. small, 4-parted, in axillary branched clusters Fruit $\frac{1}{4}$, a violet berry.

C. americana. French Mulberry. 6. May–July. D Ls. hairy. Fls bluish, stalkless. Virginia to Texas.

C. Giralduana. 6. July. D Ls. slightly downy. Fls lilac, fl.-stalks not longer than l.-stalks China.

C. japonica. Murasaki 5. August. D. Ls. hairless. Fls. pale pink; fl.-stalks longer than l.-stalks. Japan and Corea. (Fig 62 G)

CARYOPTERIS. Young stems grey-felted. Ls. opposite, short-stalked, grey-white down below. Fls. small, blue, 2-lipped, in branched axillary clusters, K (5), C (5). Fruit of four nutlets.

C. Mastacanthus (C. incana) Blue Spiraea. 8. September. D. Ls. ov., 3, tapering base, coarsely toothed, dull green above, grey-white below. China and Japan.

C. mongolica. 3. July–August. D. Ls. linear, $1\frac{1}{2}$, entire, greyish green, downy on both sides. Mongolia. (Fig. 50 F.)

C. tangutica. 5. September–October. D Ls. ov., $1\frac{1}{2}$, with four rounded lobe-like teeth on each side. China. (Fig. 34 L.)

* *CITHAREXYLUM*. Fiddle Wood Several species in cultivation. Ls. opposite, lanc., toothed or entire, hairless, short-stalked. Fls. small, K (5), C (5), A₄, in long terminal racemes or spikes. South America. (Fig. 77 c.)

CLERODENDRON Ls. opposite, large and flexible, ov, 9. Fls. in terminal branched clusters or panicles, K (5), C (5), A₄ Fruit a berry enclosed in a persistent calyx

C. foetidum 6 August–September D. Ls heart-shaped, short-pointed, coarsely toothed, unpleasant smell when crushed Fls purplish red, fragrant China (Fig. 62 D)

C. trichotomum 12 July–September D Ls ov, long-pointed, entire or toothed, downy below, sometimes 2-3-lobed towards apex. Fls. 1, white, fragrant, petals narrow-oblong, sepals reddish. Berry bright blue to black, in crimson calyx. China and Japan (Fig 62 E.)

Variety *Fargesii* (*C. Fargesii*) Ls smaller; sepals green (Rehder).

DIOSTEA (BAILLONIA) JUNCEA. 20 June. D. Branches tall, slender, rush-like Ls. opposite, ov, lanc, $\frac{3}{4}$, toothed, the pairs some distance apart on stem Fls. $\frac{1}{4}$, pale lilac, tubular, in short axillary and terminal racemes Fruit a berry enclosed in a persistent calyx. Chile (Fig 62 H)

* LIPPIA (ALOYSIA) CITRIODORA Lemon-scented Verbena 15. August. D. Ls in threes, lanc., 4, entire, pointed, margins hairy, lemon-scented Fls small, pale purple, in terminal panicles South America (Fig 66 A)

* RAPHITHAMNUS CYANOCARPUS (CITHAREXYLUM CYANOCARPUM) 25. April. E. Young stems bristly, with axillary spines Ls opposite or in threes, ov, $\frac{3}{4}$, pointed, entire, dark green above Fls $\frac{1}{2}$, pale blue, solitary or in pairs in l.-axils on old wood. Fruit a bright blue berry. Chile (Fig 54 L)

VITEX. Ls opposite, digitate, long-stalked; lfts grey-felted below. Fls. small, purple or white, in axillary or terminal spikes or branched clusters. Fruit a berry surrounded by persistent calyx.

* *V. Agnus-castus* Chaste Tree 10. September–October D. Lfts linear, lanc, 6, entire, dark green above Fls. pale violet, tubular, 5-petalled, in long spikes Mediterranean region. (Fig 5 D)

Variety *alba* Fls white.

* *V. Negundo*. 15 September–October. D. Lfts. ov., lanc., toothed in middle. Fls purple, in panicles. India and China. (Fig. 5 H.)

Variety *incisa*. A smaller shrub, with smaller fl.-panicles and berries.

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Family 78. LABIATAE K (5), C (5), A₂₋₄, G (2)

(Dead-nettle, Catmint, Ground Ivy)

Ls. opposite or whorled, usually aromatic. Fls. 2-lipped or irregularly shaped Fruit of four nutlets.

* BALLOTA FRUTESCENS. Shrubby Horehound. 1. July–August E. Stems slender, with pair of spines at each joint. Ls. ov., 1, 3-9-lobed or merely toothed, dull green, downy on both sides, slender-stalked. Fls. $\frac{1}{2}$, white, in pairs or threes in l.-axils. Riviera. (Fig. 54 H.)

* COLQUHOUNIA COCCINEA. 10. August–October. D. Ls. ov., lanc., 8, toothed, dull green and downy above, grey-felted below. Fls. 1, red or orange, 2-lipped, in whorls in terminal spikes and panicles Himalaya. (Fig. 56 P.)

ELSHOLTZIA Stems cylindrical. Ls opposite, lanc, 6, long-pointed, tapering base, toothed in middle, smell like mint. Fls arranged in whorls in terminal spikes, stamens four. Nutlets egg-shaped or oblong.

* *E. polystacha* 8. August–October E Fls. white Himalaya (Fig. 61 o.)

E. Stauntonii. 8. September–October. E Fls. purplish pink China. (Fig. 61 N)

HYSSOPUS OFFICINALIS Hyssop. 2. August–September E Stems square. Ls. linear, $1\frac{1}{2}$, minutely toothed, green, gland-dotted on both sides. Fls $\frac{1}{2}$, bluish purple in axillary whorls; stamens four, protruded. South Europe. (Fig. 50 A.)

LAVANDULA. Lavender Young stems square. Ls linear, 2, entire, grey-green and downy, margins recurved. Fls. $\frac{1}{4}$, grey-blue, in whorls in terminal spikes, stamens four.

L. Spica 4 July–September E. Ls. slightly broadened towards end. Mediterranean region

L. vera. 4. July–September E. Ls. not broadened towards end. Mediterranean region. (Fig. 50 D)

* LEONOTUS LEONURUS 4. Summer. E Branchlets 4-angled, downy, and deeply grooved. Ls lanc., 3, toothed in outer half, aromatic, tapering base, downy on both sides, dotted with oil glands below, margins recurved, very shortly stalked Fls. scarlet, in whorls. South Africa.

PEROWSKIA ATRIPLICIFOLIA. Russian Sage. 5. August–September. E Stems cylindrical, long, stiff and erect, white-felted. Ls. ov, lanc., $1\frac{1}{2}$, greyish green, unevenly toothed in outer half. Fls. $\frac{1}{4}$, violet-blue, in opposite spikes forming a large terminal panicle covered with white powdery down, stamens two. Central Asia. (Fig. 56 D)

* PHLOMIS FRUTICOSA Jerusalem Sage 6 June. E. Stems square, stout, grey-felted. Ls ov, 5, dull green, wrinkled, prominently net-veined, minutely round-toothed. Fls 1, yellow, hooded, in crowded axillary whorls. South Europe. (Fig 56 B)

PROSTRANTHERA Mint Bush. Fls. $\frac{1}{2}$, bell-shaped, in terminal racemes or panicles.

* *P. lasianthos*. 20. April–May. E. Ls. ov., lanc., 3, sharply toothed, hairless. Fls. white, tinged with pink or purple. Australia. (Fig 56 G)

* *P. rotundifolia*. 12 April–May. E. Stems very slender, grey-felted. Ls. roundish ov, $\frac{1}{2}$, entire or round-toothed at end, dark glossy green, hairless, gland-dotted. Fls purple. Tasmania. (Fig. 56 F.)

ROSMARINUS OFFICINALIS. Rosemary. 7. July–August (and again in winter). E Ls. linear, 2, entire, blunt-ended, dark green above, white-felted below, margins recurved. Fls. $\frac{1}{2}$, pale violet, in 2-3-flowered clusters in l.-axils. Europe and Asia Minor. (Fig. 50 c.)

SALVIA. Sage Stems square. Ls. greyish green, round-toothed, downy on both sides. Fls. in pairs or whorls in terminal erect racemes, stamens two.

* *S. Grahami*. 4. June–July. E. Ls. ov., 3, smelling like black currant. Fls. 1, red to purple, in pairs in terminal racemes. Mexico. (Fig. 56 c.)

* *S. Greggii*. 4. June–July. E. Ls. lanc., $1\frac{1}{2}$. Fls. 1, red to purple, in pairs or threes in terminal racemes. Mexico.

SALVIA—continued

S officinalis. Garden Sage 2 July E Ls ov, 3, much wrinkled Fls $\frac{3}{4}$, purple, in whorls in terminal racemes South Europe (Fig. 56 A)

Variety *alba* Fls. white

Variety *purpurea* Stems and ls reddish.

SATUREIA MONTANA Winter Savory 1 August $\frac{1}{2}$ E Stems erect. Ls. linear, 1, entire, pointed, pitted on both sides, stalkless Fls. $\frac{1}{2}$, purple or whitish, in terminal leafy panicles. South Europe. (Fig. 50 B)

TEUCRIUM Germander. Stems square. Fls. purple or rose, upper lip deeply 2-cleft, stamens protruding

T Chamaedrys. $\frac{3}{4}$ July–September. E. Stems hairy Ls ov, 1, coarsely toothed Fls. $\frac{1}{2}$, purple or rose, in whorls of four in loose terminal spikes. Europe and West Asia. (Fig. 56 E.)

* *T fruticans*. 8 July–September E Stems white-felted. Ls ov, lanc., $1\frac{1}{2}$, entire, dark green above, white-felted below, pairs somewhat distant on stem Fls pale purple, in erect leafy racemes. South Europe. (Fig. 66 B.)

THYMUS Thyme Prostrate shrubs only a few inches high. Ls. $\frac{1}{2}$ or less, entire, dotted with oil glands Fls small, lilac or purple, in erect racemes or spikes

T. Chamaedrys Common Thyme. $\frac{1}{4}$. May–July E Ls ov., $\frac{1}{2}$, blunt-ended. Fls. $\frac{1}{2}$, rosy purple, in elongated spikes. Europe (including Britain). (Fig. 49 F)

T Serpyllum Wild Thyme. $\frac{1}{4}$ May–July. E. Ls. ov., $\frac{1}{4}$, blunt-ended, with long white hairs below and on margins Fls $\frac{1}{4}$, rosy purple, in rounded heads. Europe (including Britain), North Africa, West Asia. (Fig. 49 H.)

T. vulgaris Garden Thyme. 1. May–July. E. Ls. lanc, $\frac{1}{2}$, grey, downy, margins recurved Fls. $\frac{1}{2}$, lilac, in terminal spikes South Europe. (Fig. 49 G.)

SUB-CLASS III. MONOCHLAMYDEAE

Perianth not differentiated into distinct sepals and petals, usually small and inconspicuous, sometimes absent The sub-class being largely artificial is rejected by modern botanists, but is retained here in deference to custom

Family 79. CHENOPODIACEAE. P2–5, A=P, G1

(Beet)

ATRIPLEX Ls. alternate, entire, usually scurfy or mealy. Fls. unisexual, in terminal spikes.

A. canescens. Grey Sage Brush. Orach. 3. July E. Ls. linear, 2, greyish green, fleshy. Fls yellowish. West North America. (Fig. 51 G.)

A. Halimus. Tree Purslane. 8 June. $\frac{1}{2}$ E. Ls. ov. or diamond-shaped, $2\frac{1}{2}$, pointed, silvery grey. Fls. greenish. South Europe. (Fig. 125 G.)

CAMPHOROSMA MONSPELIACUM 2 July E Stems woolly, giving camphor-like smell when crushed Ls alternate, awl-shaped, $\frac{1}{4}$, hairy. Mediterranean region. (Fig. 49 P)

EUROTIA CERATOIDES. 4. July D. Branches long, slender, whitish Ls alternate, lanc, 2, pointed, 3-veined, grey-white to green Fls with yellow protruding stamens and linear woolly bracts Caucasus and Asia Minor (Fig 125 H)

SUAEDA FRUTICOSA. Shrubby Goosefoot. 4 June $\frac{1}{2}$ E Stems erect, hairless. I s. alternate, linear, $\frac{1}{4}$, cylindrical, fleshy, bluish green North temperate regions (Fig. 51 K)

Family 80. *PHYTOLACCACEAE* P₅, A₅, G₁

ERCILLA VOLUBILIS (BRIDGESIA SPICATA). 20 March–April. E. Climbs by aerial roots which form adhesive disks on stem. Ls. alternate, ov, $1\frac{1}{2}$, fleshy, bright green, margins crinkled Fls. $\frac{1}{4}$, dull white, or pinkish, in short dense spikes at end of side shoots South America (Fig 125 J)

Family 81 *POLYGONACEAE*. P_{3–6}, A_{6–9}, G₍₃₎

Stem with swollen joints and clasped by stipules above l-bases.

ATRAPHAXIS Goat Wheat. July–August D The genus includes several low, rather unattractive shrubs with slender stems clasped by transparent stipular sheaths. Ls alternate, ov., lanc, usually small, with wavy margins, hairless Fls small, pinkish white *A. Muschketovi* grows to 8 feet, with ls up to 2 inches long, In *A. spinosa* the branches often end in spines Central Asia. (Fig 125 N and O)

BRUNNICHIA CIRRHOSA 25 July–August. D. Climber with slender grooved stems; sheath very short, branchlets end in tendrils Ls alternate, ov., 6, straight or heart-shaped base, entire, dark green, hairless Fls very small, greenish white, in large panicles South United States. (Fig 125 P)

MUEHLENBECKIA COMPLEXA. Climbing or prostrate shrub September. D. Dense masses of wiry interlacing stems; sheath very small Ls. alternate, fiddle-shaped, $\frac{3}{4}$, dull green, hairless. New Zealand. (Fig. 125 M)

POLYGONUM BALDSCHUANICUM 40 August–October. D. Climber. Stems slender, grey, hairless. Ls alternate, heart-shaped, 4, pale green, hairless. Fls $\frac{1}{4}$, pinkish white, in large panicles. Fruit 3-angled Central Asia. (Fig. 125 Q)

Family 82 *ARISTOLOCHIACEAE*. P (3), A (6), G_{4–6}

ARISTOLOCHIA. Dutchman's Pipe, Birthwort Climbers Ls alternate, heart-shaped, 5-7-nerved at base. Fls. large, yellowish green, U-shaped, solitary on slender stalk. Fruit 3, 6-ribbed.

A. moupinensis. 15. June. D. Ls. 4, leathery, downy below. China. (Fig. 126 B.)

A. Siph. 30. June–July. D. Ls. 10, hairless. U.S.A. (Fig. 126 A.)

Family 83 *MONIMIACEAE* P (6-12), A6-12, G several

* *LAURELIA SERRATA* 50 April E Young stems square Ls opposite, ov, 5, tapered at both ends, coarsely toothed, dark glossy green, hairless, aromatic, short-stalked Fls small, yellowish green Seeds with tufts of fine hairs. Chile (Fig 60 c)

Family 84 *LAURACEAE* P (4-6), A8-∞, G₁

Ls alternate, entire, aromatic Fls small, inconspicuous, usually in small axillary clusters Fruit a berry

* *CINNAMOMUM CAMPHORA*. Camphor Tree 60 April. E Ls. ov, 6, long-pointed, tapering base, leathery, glossy, hairless, the lowest pair of veins often so strongly developed as to make the ls appear 3-nerved Fls greenish white in long-stalked panicles up to 3 long. China and Japan. (Fig. 126 c)

LAURUS Laurel, Sweet Bay. Ls ov., lanc., 4, pointed, leathery, glossy, hairless Fls greenish yellow, 4-parted, in small axillary clusters Fruit a black shining berry.

* *L. canariensis* 60 April E Branchlets downy, purplish. Ls hairy below, conspicuously veined Canary Islands and Azores.

L. nobilis Poet's Laurel 60 May E. Branchlets and ls. hairless Ls often turn brown at tip, usually have glands in vein-axils, margins often wavy. Mediterranean region (Fig 126 d)

Variety *angustifolia*. Ls narrow.

Variety *undulata*. L -margins conspicuously wavy.

LINDERA BENZOIN (*BENZOIN AESTIVALE*). Spice Bush 12 April. D Ls obov, 5, thin, margins hairy, very pungent spicy smell. Berry dark red or purple. U S A. (Fig. 126 e)

LITSAEA (*TETRANTHERA*) Fls unisexual, in 2-6-flowered heads which, in bud, are enclosed by several large bracts, anthers 4-celled

* *L. gemculata*. Pond Spice. 6 February-March D. Branchlets zigzagged. Ls ov., 2. Berry red. South-east United States.

* *L. japonica*. 60 April E. Ls. ov, lanc., 6, bright glossy green above, midrib and veins below covered with brown down, crowded at end of shoot. Berry black. Japan. (Fig 126 f.)

SASSAFRAS OFFICINALE (*S VARIIFOLIUM*) Ague Tree 90. May. D. Ls. ov., 6, 3-nerved, glossy green above, often with conspicuous lobe on one or both sides. Fls. in branched clusters or racemes. Berry bluish black with red fleshy stalk. U.S.A. (Figs. 31 g and 126 h.)

UMBELLULARIA CALIFORNICA. Californian Laurel or Spice Tree. 100. April. E. Ls. lanc., 5, dark green and glossy above, hairless. Fruit 1, egg- or pear-shaped, green changing to purplish. California. (Fig. 126 j.)

Family 85. *PROTEACEAE*. P (4), A₄, G₁

* *EMBOTHRIUM COCCINEUM* Fire Bush. 30. May. E Ls alternate, ov., lanc., 4, entire, leathery, hairless Fls. 1½, crimson-scarlet, tubular, the four lobes afterwards curling back and exposing the long erect style. Chile. (Fig. 126 g.)

GREVILLEA. Stems downy Ls alternate or in clusters, linear, pointed, margins recurved.

* *G. rosmarinifolia*. 7. February–June E Ls 2, dark grey-green above, silvery white below Fls 1, red, in terminal racemes Australia. (Fig. 51 D)

* *G. sulphurea*. 7. May–June E Ls 1, prickly pointed, pale below, almost hairless. Fls 1, pale yellow, in terminal and axillary racemes Australia.

* GUEVINA AVELLANA Chilean Nut 40. August E Branchlets stout, downy. Ls alternate, pinnate or 2-pinnate; lfts. ov., up to 7 long, rounded or straight at base, sharply toothed, leathery and glossy Fls ivory-white, in axillary racemes. Fruit $\frac{3}{4}$, a hard nut, finally black, seeds edible Chile (Fig 20 A)

* HAKEA SALIGNA April–May. E. Ls alternate, ov., lanc., 6, blunt-ended or with minute point, veins very indistinct Fls. small, white, in dense axillary clusters. Fruit 1, beaked. Australia (Fig 119 F)

LOMATIA Branchlets downy Ls. alternate, leathery

* *L. ferruginea* 30 April–May E. Branchlets covered with reddish brown velvety down. Ls pinnate, lfts 3, deeply and pinnately lobed, dark green above, tawny down below Fls. $\frac{1}{2}$, red and yellow, in axillary panicles South America. (Fig 20 B)

* *L. obliqua*. 12 E Ls ov, 4, blunt-ended, coarsely round-toothed, glossy green above, tawny below, stalk brown. Fls not seen South America. (Fig. 104 H)

* TELOPEA TRUNCATA Tasmanian Waratah 25. June E Branchlets stout, covered with brown down. Ls alternate, oblanc, 4, entire or toothed near apex, leathery, dull green above, glaucous below, crowded. Fls 1, crimson, in terminal heads up to 3 across, style long and curved. Seed-pod 2, cylindrical, curved Tasmania. (Fig 127 J)

Family 86. THYMELEACEAE. P (4–5), A2–10, G1

Ls. alternate, entire, without stipules Fruit a berry

DAPHNE. Buds small Ls. alternate, obov., oblanc., stalkless, often crowded at end of shoot. Fls small, with a petal-like perianth, in terminal or axillary clusters.

(a) Fls. in axillary clusters

D. collina. See under (b).

* *D. Genkwa*. 4. May. D. Ls. lanc., 2, silky-hairy below. Fls. $\frac{1}{2}$, lilac. China and Japan.

D. Houtteana. Purple-leaved Daphne. 4 April $\frac{1}{2}$ E. Ls. oblanc., 4, purple. Fls. pale lilac. Hybrid.

D. Laureola. Spurge Laurel. 4. February–March. E Stems hairless. Ls. oblanc., 4, dark green, thick and firm, hairless. Fls. yellowish green, in stalkless clusters on old wood. Berry egg-shaped, bluish black, poisonous. Europe (including Britain), North Africa, West Asia. (Fig. 127 A.)

D. Mezereum. Mezereon. 5. February–March. D. Stem with hairs. Ls.

DAPHNE—continued

oblanc., 3, greyish green, hairless Fls purplish red, fragrant. Berry red Europe and Siberia (Fig. 127 D)

Variety *alba* Fls white

Variety *grandiflora* Fls. larger, October–February.

D. pontica. 3. April E Stem hairless Ls obov, 3, pointed, glossy green, hairless Fls. yellowish green, long-tubed, fragrant, in stalked axillary pairs. Asia Minor (Fig 127 C)

(b) Fls in terminal heads

D. alpina 1 May–June D Stems downy Ls oblanc, $1\frac{1}{2}$, grey-green, downy on both sides Fls white, fragrant Berry yellowish red Alps

D. Blagayana 1 March–April E Ls. obov, $1\frac{1}{2}$, hairless, in rosette-like tufts at end of twigs Fls $\frac{1}{2}$, creamy white, very fragrant Berry pinkish white Mountains of East Europe. (Fig. 127 B)

D. Cneorum Garland Flower $\frac{1}{2}$ May. E. Trailing plant with slender stems. Ls oblanc, 1, greyish green, hairless, in rosette-like tufts Fls rosy pink. Berry yellowish brown South Europe. (Fig 127 E)

D. collina 3. May. E Stems silky, hairy. Ls. obov, $1\frac{1}{2}$, blunt-ended, dark glossy green above, hairy below. Fls purplish rose, fragrant, silky-felted. Italy and Asia Minor (Fig 127 F)

D. Dauphnu. 4 May E Ls lanc, 3, glossy green, hairless Fls $\frac{1}{2}$, reddish purple, very fragrant, hairy. Hybrid.

D. neapolitana (*D. Fromana*). 3. March–May E Stem with small hairs Ls oblanc, 1, dark glossy green above, glaucous and hairy below. Fls. rosy purple Hybrid

* *D. odora* (*D. japonica*) 6 April–July. E. Stems hairless Ls lanc., 3, dark green, hairless. Fls. $\frac{1}{2}$, rosy purple, very fragrant China and Japan. (Fig 127 G)

D. petraea (*D. rupestris*). $\frac{1}{2}$ June. E. Ls oblanc., $\frac{1}{2}$, hard and leathery, crowded, dark green Fls pink, fragrant. South Tyrol. (Fig. 127 H.)

D. striata $\frac{1}{2}$. May E Like *D. Cneorum*, but stems hairless and fls. streaked. Alps

DIRCA PALUSTRIS Leatherwood 6. March–April. D. Stems jointed, very flexible (can be twisted round and round without breaking), buds downy. Ls. ov., 3, pale green above, glaucous below. Fls. pale yellow, in 2–3-flowered clusters on joints of old wood; stamens eight, protruded. Berry pale green or reddish China. (Fig. 127 L.)

* EDGEWORTHIA PAPYRIFERA (E. CHRYSANTHA). 6. February–March. D. Stems olive-green, very tough and flexible (see *Dirca*). Ls. lanc., 5, dull green above, greyish below, silky hairs when young Fls. $\frac{1}{2}$, yellow, silky-hairy, in round terminal heads. China. (Fig. 127 K.)

PIMELEA. Ls. opposite, ov, entire. Fls. $\frac{1}{4}$, tubular, in compact heads surrounded by ov. bracts, P (4), A₂, G₁ Fruit a berry.

* *P. ferruginea*. 2. June. E. Ls $\frac{1}{2}$, margins recurved. Fls. pink. Australia.

* *P. ligustrina*. 6. June. E. Ls. 1. Fls. white. Australia. (Fig. 67 D.)

Family 87 *ELAEAGNACEAE*. P (4), A4-8, G1

Stems and ls with brown or silvery scales Fls in 1-axils. Fruit a berry, enclosed by persistent perianth

ELAEAGNUS. Ls alternate, short-stalked Fls 4-parted.

(a) *Deciduous*

- E. angustifolia* (*E. hortensis*) Oleaster 20 July–August Branches silvery, spiny. Ls lanc, 3, dull green above, silvery below Fls $\frac{1}{4}$, bell-shaped, silver outside, yellow within, solitary or in 2-3-flowered clusters Berry silvery. Mediterranean region (Fig 127 O)
- E. argentea*. Silver Berry. 12. May Branches brown Ls ov, $2\frac{1}{2}$, silvery white on both sides. Fls. $\frac{1}{2}$, drooping, silvery outside, yellow within, in few-flowered clusters. Berry silvery North America. (Fig 127 R)
- E. multiflora* (*E. longipes*). 10 April–May. Branches brown Ls ov., $2\frac{1}{2}$, green and hairy above, silvery below and dotted with brown scales. Fls. $\frac{1}{2}$, solitary or in few-flowered clusters Berry orange-coloured, edible China and Japan.
- E. umbellata*. 20. May–June. Branches brown, often thorny Ls. lanc, 4, bright green above, silvery below Fls $\frac{1}{2}$, funnel-shaped, silvery outside, creamy white within, in few-flowered clusters. Berry red. Himalaya, China, and Japan (Fig. 127 N.)

(b) *Evergreen*

- E. glabra* 20 October–November. Rambler. Branches glistening brown Ls ov, $2\frac{1}{2}$, long-pointed, glossy green above, glistening silvery below. Fls funnel-shaped, brown outside, white within Berry grey or rusty. China and Japan (Fig 127 P)
- E. macrophylla*. 12. October–November Branchlets silvery white Ls. ov, 4, dark glossy green above, silvery below Fls. $\frac{1}{2}$, very fragrant, nodding in 4-6-flowered clusters. Berry red. Japan and Formosa.
- E. pungens* 15. October–November. Branchlets brown, spiny. Ls ov, 4, leathery, rounded base, margins wavy, dark glossy green above, dull white below dotted with brown. Fls. $\frac{1}{2}$, drooping, silvery white, in few-flowered clusters. Berry red China and Japan (Fig 127 Q)
- Variety *aurea*. Ls margined with yellow.
- Variety *aureo-variegata*. Ls. yellow in middle.
- Variety *reflexa*. Less spiny; ls. brown-scaly below, margins not wavy.

HIPPOPHAE RHAMNOIDES. Sea Buckthorn. 40. April. D. Branchlets often spine-tipped, young parts silvery. Ls. alternate, linear, 3, dark green above, silvery below. Fls. very small, in small axillary clusters on old wood, sexes on different trees. Berry $\frac{1}{4}$, orange - coloured Europe (including Britain) and Temperate Asia. (Fig. 51 A.)

SHEPHERDIA ARGENTEA. Buffalo Berry. 12. February–March. D. Ls. opposite, lanc., 2, round-ended, silvery below. Berry $\frac{1}{4}$, scarlet. North America. (Fig. 54 K.)

Family 88 LORANTHACEAE P (3-4), A₃-4, G₁

VISCUM ALBUM Mistletoe March-April E Parasite on apple trees, but will grow on almost any tree Branches green dividing into two at each joint. Ls. opposite, lanc, 4, round-ended, yellowish green, stalkless Fls inconspicuous, in forks of branches Berry $\frac{1}{2}$, white, 1-seeded. Europe (including Britain) and North Asia (Fig 76 G) According to Rehder the American Mistletoe, *Phoradendron flavescens*, differs in the ls being 3-5-nerved and the fls. in axillary spikes

Family 89 BUXACEAE Male fl P₄, A₄; female P₆, G (3)

BUXUS Box. Young branchlets square Ls. opposite, ov, 1, entire, rounded or notched at end Fls yellowish green, in axillary clusters Fruit a dry 3-horned capsule

B balearica Balearic Box 30 April-May. E Ls leathery, glossy, dark green above, pale below Balearic Islands

B sempervirens Common Box. 30 April E Like above, but ls. glossier and smaller. Europe (including Britain), North Africa and North Asia. (Fig 67 H.)

Variety *argentea*. Ls with white border

Variety *aurea pendula* Golden Weeping Box

Variety *pendula* Green weeping form

Variety *suffruticosa* Edging Box. Dwarf; ls obov.

PACHYSANDRA. Mountain Spurge Low shrubs not exceeding 1 foot. Stems erect, fleshy Ls alternate, ov, coarsely and unevenly toothed, 3-nerved at base, crowded at end of stem Fls small, unisexual, in erect spikes, the females at the base. Fruit a 3-horned capsule

P procumbens Alleghany Spurge. April. $\frac{1}{2}$ E Stems downy. Ls. 3, with hairs South-east United States (Fig. 104 K)

P terminalis April. E. Stems hairless Ls 2, hairless. Japan. (Fig. 104 J)

SARCOCOCCA. Low evergreen shrubs Ls. alternate, entire, pointed, leathery and glossy, 3-nerved at base, hairless Fls. small, unisexual, in axillary racemes or clusters, the females at the base. Fruit $\frac{1}{4}$, a berry.

S humilis. 1 $\frac{1}{2}$ February-March. Ls. lanc., 3, with prominent nerve parallel to each margin Berry round, blue-black China. (Fig. 128 C.)

S ruscifolia. 2. February-March Ls. ov, 2 $\frac{1}{2}$, long-pointed. Fls. white, fragrant, in few-flowered clusters. Berry round, crimson. China. (Fig. 128 B)

S saligna (*S. pruniformis*). 3. March-May Ls. lanc., 5, long-pointed, with marginal vein. Berry egg-shaped, purple. Himalaya. (Fig. 128 A.)

Family 90. EUPHORBIACEAE. P₄-10 or 0, A₁-∞, G (3)

ANDRACHNE COLCHICA. 3. June-September. D. Stems erect, very slender, hairless. Ls ov., $\frac{3}{4}$, entire, rounded base, hairless, crowded. Fls. $\frac{1}{4}$, yellowish green, unisexual, male in axillary clusters, female solitary in l.-axils, P₅+5, A₅. Fruit $\frac{1}{4}$, a dry pale-brown capsule. Caucasus. (Fig. 128 D.)

DAPHNIPHYLLUM MACROPODUM 12 May E Branchlets hairless Ls. alternate, lanc., 8, entire, pointed, dark green above, glaucous below, crowded radially at end of shoot, stalk reddish Fls small, pale green, aromatic, in axillary racemes on old wood, P3-8. Fruit $\frac{1}{4}$, a blue-black berry China and Japan (Fig 128 G)

EUPHORBIA WULFENII Shrubby Spurge. 5. April-May. E. Stems erect, unbranched, downy, fleshy and filled with milky juice Ls. alternate, linear, 5, entire, pointed, blue-green, crowded radially on upper part of stem. Fls $\frac{1}{2}$, greenish yellow, in large terminal panicles Dalmatia. (Fig 52 H)

SECURINEGA. Stems hairless. Ls alternate, ov, 2, dull green, hairless Fls greenish yellow, unisexual, P5, A5, male in axillary clusters, female solitary. Fruit $\frac{1}{4}$, a dry greenish capsule.

S. flueggeoides. 5. August D Branchlets brown. Japan. (Fig 128 E.)

S. ramiflora. 5. August D. Branchlets green East Asia.

Family 91. *ULMACEAE* P4-9, A4-9, G (2)

Ls stipulate.

APHANANTHE ASPERA 60 D Ls. alternate, ov, 4, evenly toothed, 3-nerved at base, parallel-veined, rough on both sides Fls very small, unisexual. Fruit $\frac{1}{4}$, a black-purple berry. China and Japan (Fig 105 A.)

CELTIS. Nettle Tree. Bark grey, smooth. Ls alternate, toothed, 3-nerved at base, rough on both sides, unequal-sided at base. Fls small, greenish, unisexual Fruit a berry.

C. australis 70. May. D Ls lanc, 5, long-pointed. Berry reddish brown. Mediterranean region (Fig 105 B.)

C. caucasica. 20. May D. Branchlets downy. Ls ov, lanc, 5, short-pointed, coarsely toothed Berry reddish brown Caucasus (Fig 105 C.)

C. occidentalis Sugarberry, Hackberry. 120. May. D Ls ov, 4, long-pointed, rounded base. Berry purple. North America. (Fig. 105 D.)

PLANERA AQUATICA. Water Elm 35. April-May. D Ls alternate, ov, 3, unevenly toothed, pinnately nerved, rough above, scurfy and downy below, very shortly stalked. Fruit $\frac{1}{2}$, an irregularly ribbed 1-seeded nut U.S.A (Fig. 105 E.)

PTEROCELTIS TATARINOWII 50 D. Bark grey, peeling off in long flakes. Ls. alternate, ov., 3, long-pointed, unevenly toothed, 3-nerved at base, rough above. Fruit $\frac{1}{2}$, winged, slender-stalked. China. (Fig 105 F.)

ULMUS Elm. Ls. alternate, ov., double-toothed, parallel-veined, unequal-sided at base, usually rough above. Fls small, green or reddish, appearing before ls. in small clusters in axils of l.-scars on previous year's growth. Fruit flat, winged, 1-seeded.

(a) *Ls. smooth above*

U. nitens (*U. foliacea*). Smooth-leaved Elm, Feathered Elm. 100. February-March. D. Branches often corky. Ls. ov, 4, long-pointed Seed close
* to notch of wing. Europe (including Britain). (Fig. 105 G.)

Variety *pendula*. Weeping form.

U. stricta. Cornish Elm. 100. February-March. D. Ls. ov., 2. Fruit $\frac{3}{4}$,

ULMUS—continued

seed close to notch of wing Cornwall, Devon, Somerset, Brittany.
(Fig 105 K)

Variety *Wheatleyi*. Guernsey or Jersey Elm. Narrow tree with stiffer and more erect branches Fruit like *U nitens*.

(b) *Ls rough above*

U americana American or White Elm 120 March D. A wide-spreading tree with ashy-grey bark Ls. ov, obov., 6. Fruit ov, obov, $\frac{1}{2}$, fringed with hairs North America (Fig 105 H)

U campestris. English Elm 150 February–March. D. Ls. $3\frac{1}{2}$ Fls reddish. Fruit $\frac{1}{2}$, seed close to notch of wing. South England. (Fig 105 J.)

Variety *Louis Van Houttei* Ls yellow

Variety *variegata* Ls variegated with white

Variety *viminalis*. Ls 2, long-pointed. A slender narrow-headed tree with drooping branchlets

U major Dutch Elm 120 February–March. D. Branches often drooping. Ls ov, 5, nearly smooth above Fruit 1, seed close to notch Natural hybrid.

U minor. East Anglian or Lock Elm. 90. February–March. D. Ls ov, $2\frac{1}{2}$. Fruit $\frac{1}{2}$, seed close to notch. East and Central England, and Hampshire. (Fig 105 L)

U. montana (*U. glabra*) Wych Elm. 125. February–March D. A wide-spreading and rather open tree Ls. ov., obov, 7 Fruit 1, seed in centre of wing. North Europe (including Britain) (Fig 105 N.)

U. vegeta Huntingdon Elm, Chichester Elm. 100. March. D Ls. 6. Fruit $\frac{3}{4}$, seed nearly in centre of wing Natural hybrid. (Fig. 105 M.)

ZELKOVA CRENATA 100 April–May. D Bark smooth Trunk short, dividing into large number of erect branches. Ls. alternate, ov., 3, rounded or heart-shaped base, coarsely and more or less evenly toothed, scattered hairs above. Fruit $\frac{1}{4}$, not winged. Caucasus (Fig 106 A)

✓

Family 92. MORACEAE P₄, A₄, G₁

Stems with milky juice. Ls. alternate, stipulate. Fruit fleshy.

BROUSSONETIA. Paper Mulberry. Ls ov, 8, toothed, long-pointed, 3-5-nerved and rounded at base, often lobed. Fls. $\frac{1}{2}$, white, unisexual, in clusters or catkins. Fruits in a rounded head, 1 across.

• *B Kazinokii*. 15. May. D. Ls. with few hairs, stalk less than 1. Fls. in clusters. Japan.

B. papyrifera. 30. May. D. Ls. woolly below, stalk more than 1. Fls. in long drooping catkins. China, Japan, South Sea Islands. (Fig. 28 E.)

CUDRANIA (VANIERIA, MACLURA) TRICUSPIDATA (C. TRILOBA). Silkworm Thorn. 20. July. D. Branches thorny, hairless. Ls. ov., 4, entire or shallowly 3-lobed near apex, rounded at base, dark green above, slightly downy below. Fls. green, crowded into little balls in l.-axils, sexes on different trees. Fruit 1, red, egg-shaped, hard and shiny. China. (Fig. 127 M.)

FICUS CARICA. Fig Tree. 30 May. D. Ls. ov., 8, 3-5-lobed, palmately nerved, heart-shaped base, rough above. Fls. produced inside a pear-shaped receptacle which enlarges and becomes the fruit. West Asia. (Fig. 28 c)

MACLURA AURANTIACA (M. POMIFERA). Osage Orange, Bow Wood 50 June D. Branches spiny. Ls. ov., lanc., 4, entire, pointed, rounded at base, slender-stalked. Fls. green, in round clusters, sexes on different trees. Fruit 4, round, yellowish green, rough. South United States. (Fig. 128 F)

MORUS. Mulberry. Ls. 8, pointed, toothed, often lobed, heart-shaped and 3-5-nerved at base. Fls. small, in short drooping catkins in 1-axils. Fruit a composite mass of fleshy carpels

M. alba. White Mulberry 45. May. D. Ls. light green, with few hairs. Fruit cluster 1, white or pinkish. Temperate and sub-tropical Asia

M. nigra. Common Mulberry. 30. May D. Ls. dark green above, pale and downy below. Fruit cluster 1, dark red. Orient. (Figs. 28 F and 106 B)

Family 93. URTICACEAE. P₄-5, A₄-5, G₁

* **DEBREGEASIA VELUTINA** 12. May-June. D. Branchlets very tough Ls. alternate, lanc., 6, long-pointed, toothed, 3-nerved at base, dark green above, white below. Fls. small, yellow, in fleshy heads. Fruit $\frac{1}{4}$, fleshy, bright orange-yellow, edible. India. (Fig. 106 c.)

Family 94. PLATANACEAE. P₃-8, A₃-8, G₃-8

PLATANUS. Plane. Trees with smooth bark peeling off in thin large flakes Ls. alternate, ov., 10, palmately lobed, stipulate Fls. unisexual, in dense round heads. Fruits burr-like.

P. acerifolia London Plane. 100. May D. Ls. shallowly lobed, lobes longer than broad and coarsely toothed. Several fruiting heads on one stalk Hybrid (Fig. 30 B.)

P. occidentalis Button Wood. 150. May D. Ls. shallowly lobed, lobes broader than long and coarsely toothed. One fruiting head at end of each stalk. North America. (Fig. 30 c)

P. orientalis (*P. vulgaris*). Oriental Plane. 100 May. D. Ls. deeply lobed, lobes longer than broad and scarcely toothed. One fruiting head at end of each stalk. South-east Europe and West Asia (Fig. 30 A)

Family 95. LEITNERIACEAE P₀, A₃-12, G₁

LEITNERIA FLORIDANA Corkwood. 10. April. D. Trunk swollen at base; buds woolly. Ls. alternate, ov., lanc., 7, entire, pointed, tapering base, bright green above, paler below, covered with minute velvety down. Fls. unisexual, in axillary catkins appearing before ls., sexes on different trees. Fruit $\frac{3}{4}$, a light olive-brown berry. South United States. (Fig. 128 M.)

Family 96 *JUGLANDACEAE* P₄, A₃₋₄₀, \bar{G} (2)

Ls alternate, pinnate Fls unisexual, male catkins lateral, female fls terminal.
Fruit large, 1-seeded.

CARYA Hickory Branchlets with solid pith. Lfts toothed

C. alba (*C. tomentosa*) Mockernut 100 June. D Branchlets hairy; buds large, with overlapping scales Lfts ov., lanc, 7, hairy below, fragrant when crushed; 1-stalk hairy. Fruit 1½, pear- or egg-shaped, light brown, thick-stalked, kernel sweet East North America (Fig 11 C.)

C. cordiformis (*C. amara*) Bitternut 100. June D Branchlets hairless at maturity, buds bright yellow, scales not overlapping Lfts. lanc, 6. Fruit 1½, egg-shaped, grey, thin-shelled, kernel bitter. North America.

C. glabra (*C. porcina*) Pignut 90 June. D. Branchlets hairless; buds small, with overlapping scales Lfts ov, lanc, 7, terminal one the largest, hairless Fruit 1, pear-shaped, slightly winged towards apex, thin-shelled, kernel bitter. East North America

C. ovata. Shellbark Hickory, Shagbark Hickory 100 June. D. Bark shaggy, branchlets bright reddish brown, buds large, with overlapping scales Lfts five, ov., lanc, 7, margins fringed with hairs. Fruit 2, pear- or egg-shaped, white, thin-shelled, kernel sweet. East North America.

JUGLANS. Walnut Branchlets with chambered pith Ls. fragrant when rubbed.

♂ *nigra*. Black Walnut 100 May D Lfts. ov., 6, toothed Fruit 2, round, ridged North America (Fig. 11 F)

♂ *regia* Common Walnut 100. May D Lfts. ov., 5, entire. Fruit 2, egg-shaped, wrinkled Caucasus to Himalaya. (Fig. 11 G)

Variety *lacinata* Lfts. cut into deep narrow lobes.

* PLATYCARYA STROBILACEA 30 June. D. Branchlets with solid pith, bright yellowish or reddish brown. Lfts ov, lanc., 4, slightly curved, double-toothed, stalkless. Catkins erect. Fruit a winged nut. China. (Fig. 17 B)

PTEROCARYA Wing Nut. Bark deeply furrowed, branchlets with chambered pith; buds stalked Lfts. lanc, 5, toothed, unequal-sided at base. Fruit a winged nut; in long, drooping spikes.

P. caucasica. Caucasian Wing Nut. 100. June D. Common 1-stalk not winged Fruit ¾, wings circular. Caucasus (Fig. 11 E.)

P. stenoptera (*P. chinensis*). 60 June. D. Common 1-stalk winged. Fruit ¾, wings oblong or lanc., forming a V. China. (Fig. 11 D.)

Family 97. *MYRICACEAE*. P₀, A₂₋₁₆, \bar{G} ₁

MYRICA. Ls. alternate, resin-dotted, toothed or lobed, sometimes entire. Fls. small, in male and female catkins.

M. (Comptoma) asplenifolia. Sweet Fern. 4. April-May. D. Stems downy. Ls. linear, 4, pinnately lobed, dark green, downy. Fruit cluster burr-like. North America. (Fig. 36 G)

MYRICA—continued

- M. californica* Californian Wax Myrtle 15 May–June. E Ls. lanc., 4, leathery, toothed, glossy green Fruits small, round, thinly coated with white wax. California (Fig. 106 E)
- M. cerifera*. Wax Myrtle. 40 March–April. $\frac{1}{2}$ E. Ls. lanc., 3, thin, toothed towards apex, glossy green above. Fruits small, round, thickly coated with white wax, in clusters on old wood. U.S.A (Fig. 106 F)
- M. Gale*. Sweet Gale, Bog Myrtle. 4 March–April. D Ls. oblanc., 2, toothed towards apex, dark glossy green. Fruit small, 3-pointed, resin-dotted, in dense catkins up to $\frac{1}{2}$ long Northern Hemisphere (including Britain). (Fig. 106 D.)

Family 98 BETULACEAE. P₄ or o, A₂–4, \tilde{G} (2)

Ls. alternate, stipulate, usually straight-veined Fls. in male and female catkins. Fruit a 1-seeded nut.

ALNUS. Alder. Stamens four. Female catkins become erect woody cones in fruit.

- A. cordata*. Italian Alder 80 March. D. Branchlets angled, hairless. Ls. broadly ov., 4, pointed, straight or heart-shaped base, finely and evenly toothed, veins curved, dark glossy green above, hairless except for tufts in vein-axils below. South Europe. (Fig. 106 H.)
- A. firma*. 30. March. D. Branchlets hairless. Ls. ov., 4, pointed, finely and doubly toothed, 12–26 pairs parallel veins Japan.
- A. glutinosa*. Common Alder. 90. January–February. D. Branchlets clammy, hairless; buds stalked. Ls. broadly obov., or circular, 4, coarsely toothed, rounded or notched at end, dark glossy green and clammy above, pale green below. Europe (including Britain), North Africa, North and West Asia. (Fig. 106 G.)
- Variety *imperialis*. Ls. cut into linear lobes. (Fig. 34 F.)
- Variety *lacinata*. Ls. deeply and pinnately lobed (Fig. 34 G.)
- A. incana*. Grey Alder, Speckled Alder. 70 Branchlets downy. Ls. ov., 4, pointed, double-toothed and slightly lobed, glaucous or grey-green below Cones stalkless or nearly so. North temperate regions. (Fig. 106 K.)
- Variety *aurea*. Ls. yellow.
- Variety *glauca*. Ls. blue-green below.
- Variety *incisa*. Ls. deeply lobed, lobes toothed.
- Variety *pendula*. Weeping form.
- A. japonica*. Japanese Alder. 80. February. D. Ls. lanc., 5, tapered at both ends, finely toothed, dark glossy green. Japan.
- A. nitida*. Himalayan Alder. 100. September. D. Ls. ov., 6, long-pointed, coarsely toothed or almost entire, glossy green above, pale green below. Himalaya. (Fig. 106 J.)
- A. oregona* (*A. rubra*). Oregon Alder. 50. February. D. Young shoots angled, hairless. Ls. ov., 6, margins recurved, 10–15 pairs parallel veins, dark green above, pale or greyish below, edged with small toothed lobes, l.-stalk and veins red or yellow. West North America. (Fig. 106 L.)

BETULA. Birch. Ls. ov., usually pointed, sharply and unevenly toothed,

BETULA—continued

straight-veined. Female catkins appear in spring at end of short shoots, male in autumn in l.-axils of long shoots and hanging on the tree throughout winter; stamens two. Nut minute, winged

(a) *Ls. with three to seven pairs lateral veins*

- B. japonica*. Japanese White Birch. 85. April. D. Bark white; branchlets warted. Ls. ov., 3, teeth bluntish and nearly even, 5-7-pairs lateral veins, slender-stalked. Japan.
- B. nana*. Dwarf Birch. 4. April. D. Branches erect, not warted, minutely downy. Ls. circular, $\frac{1}{2}$, round-toothed, dark glossy green above, net-veined below, 2-4 pairs lateral veins, very shortly stalked. North Europe (including Britain), North Asia, North America, Greenland. (Fig. 107 A.)
- B. pubescens* (*B. alba*, sub-species *pubescens*) White Birch. 70. April. D. Bark white (even in young trees), peeling off in papery layers. Branchlets downy, not warted, erect or horizontal. Ls. ov., $2\frac{1}{2}$, pointed, slender-stalked. Europe (including Britain) and North Asia. (Fig. 107 C.)
- B. verrucosa* (*B. alba*, sub-species *verrucosa*, *B. pendula*) Silver Birch. 70. April. D. Bark brown in saplings, white on older trees, peeling off in papery layers. Branchlets hairless, warted, drooping. Ls. ov., $2\frac{1}{2}$, long-pointed, slender-stalked. Europe (including Britain) and North Asia. (Fig. 107 B.)
- Variety *laciniata*. Swedish Birch. Ls. deeply lobed; lobes lanc., toothed, long-pointed. (Fig. 34 H.)
- Variety *purpurea*. Ls. purple

(b) *Ls. with seven or more pairs lateral veins*

- B. lutea*. Yellow Birch. 100. April. D. Bark yellowish brown. Ls. ov., 4, pointed, double-toothed, dull green, twelve pairs lateral veins. North America. (Fig. 107 D.)
- B. nigra*. River Birch, Red Birch. 90. April. D. Bark grey or brown, peeling; branchlets downy, warted. Ls. ov., 3, pointed, glossy green above, glaucous white below, slender-stalked. East United States. (Fig. 107 E.)
- B. Maximowicziana*. 100. April. D. Bark orange-coloured; branchlets warted, hairless. Ls. heart-shaped, 6, pointed, 10-12 pairs lateral veins. Male catkins 4, female 2 long. Japan. (Fig. 107 F.)
- B. papyrifera*. Paper Birch or Canoe Birch. 100. April. D. Bark very white and smooth; branchlets warted. Ls. ov., 3, long-pointed, dotted with small black glands below, 6-10 pairs lateral veins. North America. (Fig. 107 G.)
- B. utilis*. Himalayan Birch. 60. April. D. Trunk and branches creamy white; branchlets downy. Ls. ov., 3, rounded at base, pointed, dark green above, pale green and downy below, 9-12 pairs lateral veins. Himalaya. (Fig. 107 H.)

CARPINUS. Hornbeam. Trunk fluted, smooth-barked; buds pointed, many-scaled. Ls. ov., pointed, double-toothed, parallel-veined, equal-sided at base or nearly so, usually in two opposite rows. Male catkins drooping, appearing in spring from lateral buds on previous year's wood; female catkins erect at end of young shoots. Fruit a nut at base of 3-lobed l.-like bract, in drooping spikes.

CARPINUS—continued

C. Betulus. Common Hornbeam 80. April D Buds thin and pointed. Ls 3. Fruiting bracts 3-5-nerved at base Europe (including Britain) and West Asia (Fig 107 J.)

Variety *asplenifolia* (*laciniata*). Fern-leaved Hornbeam Ls. deeply double-toothed, almost lobed.

Variety *columnaris*. Narrow form.

Variety *pendula*. Weeping form.

C. caroliniana. American Hornbeam 40. April D. Buds egg-shaped. Ls. 4. Fruiting bracts 5-7-nerved at base. East North America. (Fig. 107 K.)

CORYLUS. Hazel. Buds rounded. Ls. ov., pointed, unevenly toothed, heart-shaped base, folded in bud. Male catkins drooping, appearing in clusters in late autumn ('lambs' tails'); female fls very small, bud-like, with red stigmas protruding Nuts formed in clusters, each nut enclosed in persistent bracts.

C. Avellana. Common Hazel. 20. February. D. Ls. 4, often slightly lobed, stalk short and hairy Nut $\frac{3}{4}$, nearly as long as bracts Europe (including Britain) and West Asia. (Fig. 108 A)

Variety *laciniata* Ls. deeply lobed.

Variety *purpurea*. Ls. purple.

C. Colurna Turkish Hazel. 80. February. D. Ls. 6. Nut $\frac{1}{2}$, bracts deeply divided into linear recurved lobes. South-east Europe to Himalaya. (Fig. 108 B.)

C. maxima. Filbert. 20. February. D. Ls. 5 Nut 1, set in bracts twice as long as itself. South Europe. (Fig. 108 C.)

Variety *atropurpurea* Ls. dark purple.

OSTRYA. Hop Hornbeam. Bark rough Buds pointed, many-scaled. Ls. ov., 4, pointed, double-toothed, parallel-veined, rounded at base. Male catkins drooping, appearing in autumn. Nut ribbed, enclosed in bladder-like bracts, in drooping spikes.

O. carpinifolia. 60. April. D. Nut egg-shaped. South Europe and Asia Minor.

O. virginica. Ironwood 50. April. D. Nut spindle-shaped. North America. (Fig. 107 L.)

OSTRYOPSIS DAVIDIANA. 10. April. D. Buds pointed. Ls. broadly ov., 3, double-toothed, shallowly lobed, heart-shaped base, scattered hairs above, downy and dotted with red glands below, short-stalked. Male catkins $\frac{1}{2}$, drooping, appearing in autumn in joints of old wood; female erect, appearing in spring at end of young shoots. Nut enclosed in conical 3-pointed bract. China. (Fig. 108 F.)

Family 99. FAGACEAE. P (4-7), A4-∞, G̃ (3)

Ls. alternate, stipulate. Fls. small, unisexual, solitary or in stalked heads or slender catkin-like spikes. Fruit of one or more 1-seeded nuts enclosed in a husk.

CASTANEA SATIVA. Sweet or Spanish Chestnut. 100. July. D. Bark furrowed. Ls. lanc., 9, coarsely and evenly toothed, straight-veined, the veins ending in teeth. Catkins 6, erect. Husk 2, prickly, enclosing two or three red-brown edible nuts. South Europe, North Asia, North Africa. (Fig. 108 D.)

CASTANOPSIS CHRYSOPHYLLA. Golden Chestnut. 100. July. D. Ls. lanc., 3, entire, pointed, tapered at both ends, dark glossy green above, golden scurf below. Catkins 1, erect Husk $1\frac{1}{2}$, prickly, enclosing one pale-brown edible nut. California and Oregon. (Fig. 128 L.)

FAGUS. Beech. Bark smooth, grey. Buds long and pointed Ls. ov., parallel-veined, dark glossy green above, margins fringed with white hairs when young. Male fls. in long-stalked heads, female solitary or in pairs, surrounded by bracts. Fruit of two smooth triangular nuts enclosed in a 4-lobed woody husk covered with thick bristles

F. americana (*F. grandifolia*) American Beech. 100. Ls. 4, coarsely toothed, 9-12 pairs lateral veins East North America

F. sylvatica Common Beech 100 Ls. 3, vaguely toothed or entire, 5-9 pairs lateral veins Europe (including Britain) and Asia Minor. (Fig. 108 E.)

Variety *cuprea*. Copper Beech. Ls. coppery red.

Variety *heterophylla* Fern-leaved Beech. Ls. deeply and pinnately lobed. (Fig. 34 D)

Variety *pendula* Weeping form.

Variety *purpurea* Ls. deep purple.

NOTHOFAGUS. Southern Beech Ls. small (2 or less). Fls. solitary or in few-flowered clusters. Fruit of three smooth triangular nuts in a 4-winged husk.

N. antarctica. Antarctic Beech. 120. May D Branchlets downy. Ls. ov., 1, rounded at end, straight or heart-shaped and unequal-sided at base, minutely toothed, often lobed South America (Fig. 34 N)

N. betuloides. 120. May. E. Branchlets clammy. Ls. ov., 1, minutely and evenly toothed, crowded on branch. South America

* *N. cliffortioides*. Mountain Beech. 50 E. Ls. ov., $\frac{1}{2}$, entire, net-veined, hairless, in two regular rows. New Zealand. (Fig. 128 N)

N. Dombeyi. 100. May. E. Branchlets downy. Ls. ov., 1, unevenly toothed, prettily net-veined, rounded base, in two opposite rows. South America. (Fig. 108 G)

N. obliqua. Roblé Beech. 100. May. D. Branchlets hairless. Ls. ov., lanc., 3, double-toothed or shallowly lobed, hairless, unequal-sided at base. South America. (Fig. 34 O.)

QUERCUS. Oak. April-May Ls. alternate, usually toothed or pinnately lobed. Male catkins drooping, in clusters; female fls. few and inconspicuous. Fruit a 1-seeded nut (acorn) enclosed in a cup.

(a) *Evergreen oaks*

Q. acuta. 40. Ls. ov., 5, leathery, entire, dark glossy green above, dull yellowish below, margins wavy, 8-10 pairs lateral veins. Acorns crowded on a spike, cup downy. Japan. (Fig. 128 H.)

Q. agrifolia. Encena or Live Oak 80 Branchlets densely downy. Ls. ov. or roundish, 2, spine-toothed, hard, dark glossy green above, hairless except for tufts in vein-axils below. Acorns solitary or in pairs. California. (Fig. 108 H.)

Q. chrysolepis. Maul Oak. 50. Young shoots downy. Ls. ov., 2, spine-toothed in young plants, glossy green above, yellow and downy below in first year, 4-10 pairs parallel veins, very shortly stalked. Acorns solitary or in pairs. California and Oregon. (Fig. 109 C.)

QUERCUS—continued

- Q. coccifera*. Kermes Oak, Grain Tree. 12 Ls ov., $1\frac{1}{2}$, leathery, spine-toothed, dark green above, hairless. Acorn cup with reflexed spiny scales. Mediterranean region (Fig 109 B)
- Q. densiflora* Tanbark Oak 70 Young shoots woolly Ls ov, 4, stiff and leathery, 12-14 pairs parallel veins each ending in a sharp tooth, dark glossy green above, white-felted or glaucous below Acorns solitary or in pairs. California and Oregon (Fig 109 E)
- Q. glabra* (*Q. edulis*). 30. Young shoots hairless Ls. lanc, oblanc., 6, entire, tapered at both ends, blunt-ended, leathery and glossy, yellowish green above, dull greyish below, 9-11 pairs parallel veins. Acorns in threes on spikes up to 3 long. Japan. (Fig. 128 J.)
- Q. Ilex*. Common Evergreen Oak, Holm Oak 90 Bark grey, nearly smooth; branchlets downy. Ls. ov., lanc, 3, entire or in young trees, sometimes vaguely toothed or even spine-toothed, dark green above, white- or tawny-felted below when young Acorns $\frac{1}{2}$, solitary or in small clusters on short stalk Mediterranean region (Fig 109 A)
- Q. myrsinaefolia* (*Q. bambusaefolia*) Bamboo-leaved Oak 50. Ls lanc., 4, long-pointed, tapering base, distantly toothed, glossy above, somewhat glaucous below. Acorns in short spikes, cup hairless. Japan (Fig. 109 G.)
- Q. Suber* Cork Oak 60. Bark thick and corky. Branchlets downy Ls. ov, $2\frac{1}{2}$, toothed, dark glossy green above, grey-felted below. Acorns solitary or in pairs on short stalk. South Europe and North Africa (Fig. 109 D)

(b) *Deciduous oaks*

- Q. Aegilops*. Valonia Oak. 80. Branchlets covered with yellowish down Ls. ov., 4, lobes triangular and pointed, dark glossy green above, grey below, base rounded or heart-shaped. Acorns very large (up to 2 across). South Europe and Asia Minor.
- Q. borealis*. Red Oak. 60. Like *Q. coccinea* (see below), but ls. less deeply lobed North America.
- Q. castaneaefolia*. Chestnut-leaved Oak 100. Branchlets downy. Ls. lanc, 7, strongly parallel-veined, the veins ending in coarse teeth, dark glossy green above, dull grey and minutely downy below. Acorn cup with reflexed downy scales. Caucasus. (Fig. 109 F)
- Q. Cerris*. Turkey Oak 120. Branchlets downy; buds with linear stipules. Ls. ov., lanc., 5, lobes triangular and pointed, dark green and rough above, greyish green below, thin and firm Acorn cup covered with narrow recurved scales. South Europe and Asia Minor. (Fig. 32 C.)
- Q. coccinea*. Scarlet Oak 80. Branchlets hairless, warted; buds hairy at tip. Ls. ov., 6, deeply lobed, lobes oblong or triangular and coarsely toothed near apex, small brown tufts in vein-axils below, long-stalked. North America. (Fig. 33 B.)
- Q. conferta*. Hungarian Oak. 100. Ls. obov., 6, deeply cut into six to ten oblong lobes, dark green above, greyish green and downy below, very shortly stalked. Acorns stalkless. Italy to Hungary. (Fig. 32 E.)
- Q. imbricaria* Shingle Oak. 60. Ls. ov., 6, entire, dark green above, acorn small and round. North America.
- Q. Lucombeana*. Lucombe Oak. 100. $\frac{1}{2}$ E. Ls. ov., 5, unequal-sided at base, parallel-veined, sharply toothed, glossy green above, grey-felted below.

QUERCUS—continued

Acorn more than half enclosed in cup Hybrid between Cork Oak and Turkey Oak.

- Q. macrocarpa* Burr Oak 50. Ls obov, 10, tapering base, 5-7-lobed, terminal lobe much the largest, dark glossy green above, minutely felted below Acorn cup with thread-like scales forming a fringe North America (Fig 33 c)
- Q. marilandica* Black Jack 50 Ls. broadly ov., 6, base rounded, 3-5-lobed at apex, dark glossy green above, at first brownish and hairy below, becoming green and nearly hairless East United States (Fig 33 D.)
- Q. Mirbeckii* 100 Ls ov, obov, 4, coarsely blunt-toothed, slightly heart-shaped base, glossy above, woolly below at first, becoming hairless. Acorn cluster on short stalk Spain, Portugal, North Africa
- Q. nigra*. Water Oak 80 Branchlets hairless Ls. often crowded at end of short twigs, obov, lanc, 4, pale green on both sides, lobed or entire, hairless except for tufts of down in vein-axils below, stalk very short. South United States
- Q. palustris*. Pin Oak. 100 Branchlets hairless, warted; buds hairless Ls. ov., 6, glossy, deeply lobed, the lobes oblong or triangular and toothed near apex, large brown tufts in vein-axils below, long-stalked. U S A. (Fig 33 A)
- Q. pedunculata* (*Q. Robur*) Common Oak 80 Branchlets hairless Ls. ov, 4, shallowly lobed, lobes rounded, dark green above, greyish below, small 'ears' at junction with stalk, stalk less than $\frac{1}{2}$. Acorn cluster on long slender stalk. Europe (including Britain) and Asia. (Fig. 32 A)
- Variety *concordia* Golden Oak Ls yellow
- Variety *filicifolia*. Fern-leaved Oak Ls cut into narrow slender lobes, base tapering.
- Variety *purpurescens*. Purple Oak Ls. purple.
- Q. Phellos* Willow Oak. 100. Bark smooth, grey. Ls lanc, 5, entire, tapering base, pale green Acorn very small, in shallow cup. U S A (Fig 128 K.)
- Q. rubra*. Red Oak 100 Branchlets hairless, warted. Ls. ov., 9, deeply lobed, lobes obliquely triangular and entire or with a few teeth, terminal lobe long and narrow, dull green above, greyish and downy below, with brown tufts in vein-axils, long-stalked. Acorn cup very shallow. North America. (Fig. 32 D.)
- Q. sessiliflora* Sessile Oak. Durmast Oak 80. Branchlets downy. Ls. ov., 5, deeply lobed, lobes rounded, dark green above, greyish and somewhat downy below, tapering or rounded base without 'ears,' stalk more than $\frac{1}{2}$ long. Acorn cluster on short stalk. Europe (including Britain) and West Asia. (Fig. 32 B.)
- Q. velutina* Black Oak. 80. Branchlets downy; buds hairy. Ls. ov, 12, deeply lobed, lobes triangular and entire or with a few teeth, dark green and glossy above, pale and downy below. Acorns solitary, half enclosed in cup. North America. (Fig. 34 A)

Family 100 SALICACEAE. Po, A2-30, G (2)

Ls. alternate, stipulate. Fls. in catkins, usually appearing before ls. Fruit a dry splitting capsule, containing seeds with tufts of silky hairs.

POPULUS. Poplar. Branchlets have terminal buds, which are resinous and have several scales. Ls. usually broadest below middle, long-stalked. Catkins drooping, stamens numerous.

(a) *Ls. white- or grey-felted below (White Poplars)*

- P. alba* White Poplar, Silver Poplar 60. February–March. D Bark smooth, young branchlets white-felted Ls ov., 2, palmately 3-5-lobed Europe (including Britain) and North and West Asia (Fig 28 D)
P. canescens. Grey Poplar. 100. March. D. Young branchlets white-felted Ls. roundish ov., 4, coarsely and unevenly toothed. West Europe (including Britain) (Fig. 109 H)

(b) *Ls. with clear translucent border (Black Poplars)*

- P. angulata* Carolina Poplar. 100 March. D Branchlets angular or ribbed, hairless; buds greenish. Ls ov., 7, heart-shaped or straight base, margins hairy, teeth small and curved; stalk flattened, with glands at base East United States. (Fig 110 A)
P. Eugenei. 150. D. Tall and narrow tree; branchlets hairless; buds small and sticky. Ls ov., 3, long-pointed, coarsely toothed, margins hairy. Hybrid. (Fig. 110 C.)
P. generosa. D. Buds large and sticky. Ls. ov., 12, teeth even, curved, gland-tipped; glands at base of l.-stalk. Hybrid. (Fig 110 F.)
P. monilifera (P. canadensis) Canadian Black Poplar, Necklace Poplar. 100. D Ls. ov., 5, heart-shaped base, long-pointed, teeth large and curved, margins hairy, green on both sides; stalk flattened, with glands at base East North America. (Fig. 110 B.)
P. nigra Black Poplar. 100 March. D. Branchlets cylindrical, hairless; buds sticky. Ls usually diamond-shaped or triangular, 4, shallowly round-toothed, no glands at base; stalk flattened. North Asia. (Fig 109 J)
 Variety *italica*. Lombardy Poplar. Tall and narrow
P. serotina Black Italian Poplar. 100 D Branchlets green, hairless, slightly angled. Ls. ov., triangular, 6, glands at base Hybrid. (Fig. 109 K.)

(c) *Ls without clear translucent border; stalk flattened (Aspens)*

- P. tremula*. Aspen. 50. February. D. Branchlets hairless; buds bright brown. Ls. broadly ov., 2, coarsely and unevenly blunt-toothed, greyish green. Europe (including Britain), North Africa, North Asia. (Fig. 110 D.)
P. tremuloides. American Aspen. 100. February. D. Branchlets reddish brown, hairless. Ls. broadly ov., 2, finely toothed, dark glossy green above. North America. (Fig 110 E.)

(d) *Ls. without clear translucent border; stalk not or slightly flattened (Balsam Poplars)*

- P. angustifolia*. Willow-leaved Poplar. 60. D. Branchlets cylindrical; buds long-pointed, sticky. Ls. lanc., 5, tapering base, minutely and evenly round-toothed, green on both sides. North America. (Fig. 110 H.)
P. candicans (P. balsamifera, P. tacamahaca). Balm of Gilead, Balsam Poplar,

POPULUS—continued

- Cottonwood 50 February–March D. Buds large and sticky. Ls ov., 5, somewhat coarsely round-toothed, straight or heart-shaped base, dark green above, whitish below North America (Fig 110 G)
- P lasiocarpa*. 60. D. Branchlets stout, downy Ls heart-shaped, 12, shallowly round-toothed, green below, 1-stalk and chief veins red. China.
- P szechuanica* 100 D. Branchlets angled Ls. heart-shaped, 9, finely toothed, greyish below, 1-stalk and chief veins red China (Fig 110 K.)
- P trichocarpa* Black Cottonwood 200 D Ls ov, 8, finely toothed, dark green above, white and net-veined below West North America (Fig 110 J)
- P Wilsoni* 80 D Branchlets stout, cylindrical, hairless Ls. heart-shaped, 9, minutely toothed, dull pale green above, greyish below. China.

SALIX. Willow. Branchlets usually very tough, without terminal bud, buds 1-scaled Ls short-stalked. Catkins erect; stamens usually two to five, rarely more.

(a) Adult ls. hairy or downy below

- S alba*. White Willow. 80. May D. Branches drooping at ends; branchlets olive-brown, at acute angle Ls. lanc, $3\frac{1}{2}$, finely toothed, silky hairs below. Stamens two. Europe (including Britain), Asia, North Africa. (Fig 111 A)
- Variety *argentea*. Silver Willow Ls of intense silvery colour.
- Variety *britzensis* Branches red
- Variety *coerulea*. Cricket Bat Willow. 100 Branches erect Ls. become hairless and blue-grey below in late summer
- Variety *vitellina*. Golden Willow. Branchlets yellow.
- S Andersoniana* 10 April–May. D. Like *S. phyllicifolia* (see below under (b)), but twigs and ls more downy and ovary hairless Europe (including Britain) (Fig 111 O.)
- S. Arbuscula*. 3. May. D. Ls ov., lanc., 2, deep green above, grey below, toothed or entire. Stamens two Europe (including Scottish mountains) and North Asia. (Fig. 111 B)
- S. aurita*. Round-eared Willow 6. April. D Twigs downy, buds brown or green. Ls obov, 2, vaguely toothed, dark green and wrinkled above, grey wool below, a pair of broad stipules at base of 1-stalk. Stamens two. Europe (including Britain) and North Asia (Fig. 111 C)
- S. Caprea*. Goat Willow, Sallow ('Palm'). 25 March–April D. Branchlets downy; buds yellow. Ls. ov., 4, vaguely toothed, dark green and slightly wrinkled above, grey wool below. Stamens two. Europe (including Britain) and North Asia. (Fig. 111 D.)
- S. cinerea*. Grey Willow. 10. March–April. D. Branchlets and buds covered with grey down. Ls. ov, $3\frac{1}{2}$, entire or vaguely toothed, dull grey and slightly hairy above, grey wool below. Stamens two Europe (including Britain) and North Asia. (Fig. 111 H.)
- S. incana* (*S. rosmarinifolia*). 12. April–May. D. Buds yellow. Ls. linear, 5, dark green above, white-felted below, margins recurved. Stamens two. Europe. (Fig. 53 A.)
- S. lanata*. Woolly Willow. 3. May. D. Branchlets woolly. Ls. roundish ov., 2, entire, silvery on both sides, stipules large. Europe (including Scotland) and North Asia (Fig 128 O.)

SALIX—continued

- S. Lapponum* Lapland Willow 4 April–May. D Branchlets dark brown, downy Ls ov., lanc, 3, entire, white or grey below, stipules small or absent North Europe (including Scotland) and Siberia. (Fig 128 Q)
- S. repens* Creeping Willow 1 April–May. D. Creeping by underground stems. Branchlets silky Ls. lanc, 1, entire or faintly toothed, dull grey-green above, silvery below. Stamens two. Europe (including Britain) and North Asia (Fig 128 P.)
- Variety *argentea* Ls silver-grey on both sides
- S. viminalis* Common Osier. 20. March–April D. Ls linear, 6, entire, dark dull green above, silvery grey below, midrib prominent. Stamens two. Europe (including Britain) and Asia (Fig. 53 F.)

(b) Adult Ls hairless, green below

- S. fragilis*. Crack Willow. 90 April–May. D Bark corrugated Branchlets at angle of sixty degrees or more, brittle at base, hairless. Ls lanc, 7, toothed, long-pointed Stamens two Europe (including Britain) and North Asia. (Fig. 111 E)
- S. herbacea*. Dwarf Willow Prostrate. June. D. Creeping by partly underground rooting stems. Branchlets slender, angled. Ls. roundish ov., $\frac{1}{2}$, rounded or notched at end, finely toothed, net-veined. Stamens two. Mountains of Europe (including Britain).
- S. myrsinites*. Whortle Willow. 1 May. D. Ls. ov., 1, finely toothed, 6–10 pairs parallel veins. Stamens two. Europe (including mountains of Scotland and Ireland) and North Asia. (Fig. 111 F.)
- S. pentandra* Bay Willow. 50 May. D. Branchlets brown, hairless; buds yellow Ls ov, lanc, 4, finely toothed, dark glossy green above, midrib yellow. Stamens five or more. Europe (including Britain) and North Asia. (Fig 111 J)
- S. phylicifolia*. Tea-leaved Willow. 10. April–May D Twigs bright chestnut brown. Ls ov, 3, slightly toothed or entire, glossy green above, often glaucous below. Stamens two. Europe (including Britain). (Fig. 111 G)
- S. rubra*. 20. April. D. Ls. linear, lanc., 6, toothed, long-pointed. Stamens two. Europe (including Britain). (Fig 53 C)
- S. triandra* (*S. amygdalina*) Almond-leaved Willow. 30. April–May D. Branchlets angled or furrowed. Ls lanc., 4, toothed. Stamens three. Europe (including Britain) and North Asia. (Fig. 111 K.)

(c) Adult Ls. hairless, blue-grey or whitish below

- S. babylonica*. Weeping Willow. 50. March–April. D. Branches drooping, yellowish, hairless. Ls. lanc., 4, long-pointed, finely toothed. Stamens two. China. (Fig. 111 L.)
- S. blanda*, *S. elegantissima*, and *S. pendulina* are forms of this, usually with broader Ls. and more spreading habit.
- S. coerulea* (*S. alba*, variety *coerulea*). Cricket Bat Willow. See *S. alba* under (a). Cross between *S. alba* and *S. fragilis*.
- S. daphnoides*. Violet Willow. 40. March. D. Branchlets plum-coloured, downy, brittle. Ls. lanc., $4\frac{1}{2}$, leathery, dark glossy green above, blue below, finely toothed. Europe, Siberia, Himalaya. (Fig. 111 P.)

SALIX—continued

- S. discolor*. Pussy Willow. 25. March–April. D. Branchlets purplish brown. Ls. lanc., 5, toothed, bright green above, blue-white below. Stamens two. Canada. (Fig. 111 M.)
- S. nigricans*. Dark-leaved Sallow. 12. April. D. Branchlets downy. Ls. ov., 4, toothed, dark dull green above, bluish below. Stamens two. Europe (including Britain). (Fig. 111 N.)
- S. purpurea*. Purple Osier. 18. April. D. Branchlets glossy, purple on sunny side. Ls. linear, lanc., 3, minutely toothed at outer end, glossy green above, bluish below. Europe (including Britain) and Central Asia. (Fig. 53 B.)
- S. reticulata*. $\frac{1}{2}$. May–June. D. Ls. roundish ov., 1, entire, dark green and wrinkled above, white and net-veined below. Stamens two. Europe (including Scottish Highlands) and Labrador. (Fig. 128 R.)
- S. Salamonii*. 60. D. Branchlets drooping (not so much as in *S. babylonica*). Ls. lanc., 5, finely toothed, persisting to December. Female tree only. Hybrid.
- S. viridis*. 80. May. D. Branchlets at angle of sixty degrees or more. Ls. lanc., 5, toothed, dark glossy green above, glaucous below. Natural hybrid.
- S. vitellina* (*S. alba*, variety *vitellina*). Golden Willow. See *S. alba* under (a).

Family 101. EMPETRACEAE. P4–6, A2–3, G (2–9)

Evergreen heath-like shrubs. Ls. alternate or in whorls, linear, $\frac{1}{2}$, blunt-ended, glossy green, margins recurved, crowded on stems. Fls. small, inconspicuous, purple. Fruit a berry.

COREMA ALBUM. Portuguese Crowberry. 2. April–May. Young stems very downy. Ls. usually in threes. Fls. in terminal heads. Berry $\frac{1}{4}$, white, in clusters, 3-seeded. Portugal. (Fig. 48 N.)

EMPETRUM NIGRUM. Crowberry. 1. March. Ls. usually in fours. Fls. in 1. axils. Berry $\frac{1}{4}$, black, in clusters, 6–9-seeded. North temperate (including Britain) and Arctic regions. (Fig. 48 M.)

CLASS II. MONOCOTYLEDONS

Only one l appears first when the seed germinates. The ls. which follow do not usually have a network of branching veins. There is no clear distinction of bark, wood, and pith. The parts of the fl. are usually in threes, or a multiple of three.

Family 102. *MUSACEAE* $P_3+3, A_5, \bar{G} (3)$

* *MUSA BASJOO* Japanese Banana 9. Summer E. Ls. oblong, very large (up to nine feet by two), with numerous parallel veins springing at right angles from midrib; crowded at top of erect tapering stem, which is enclosed by remains of l-stalks. Fls. yellow, in a terminal drooping spike. Fruit 4×1 , 3-angled, banana-like. Japan.

Family 103. *AMARYLLIDACEAE* $P_3+3, A_3+3, \bar{G} (3)$ (Daffodil, Narcissus, Snowdrop)

* *AGAVE AMERICANA*. 12. E Ls. linear, lanc. or awl-shaped, 12×3 , thick and fleshy, toothed, spine-tipped, dull grey-green, crowded radially in a tuft at or near ground-level. Fls. 2, white, in a large panicle at top of erect stalk 8 to 12 feet high; the plant dies after flowering. Arizona to Mexico. (Fig 38 H)

* *BESCHORNERIA YUCCOIDES* 6. June E. Ls lanc, 24×3 , entire, sharp-pointed, glaucous, margins minutely toothed, crowded radially in a tuft at or near ground-level. Fls. 2, green, drooping, in few-flowered clusters from axils of red bracts, the whole being borne on a stout erect red stalk up to 6 feet high. Fruit 2, fig-shaped. Mexico. (Fig 38 J.)

Family 104. *LILIACEAE* $P_3+3, A_3+3, \bar{G} (3)$ (Leek, Lily, Hyacinth, Bluebell, Garlic, Onion)

ASPARAGUS APHYLLUS (*A. HORRIDUS*). Rambling or shrubby. Summer. E. Ls. absent, their place being taken by alternate clusters of awl-shaped green spines. Fls. small, greenish. Fruit a black berry. Mediterranean region. (Fig. 38 K.)

CORDYLINE (*DRACAENA*). Club Palm, Dragon Tree. Ls. linear, entire, crowded palm-like at top of main stem or branches, green, firm, upper erect, lower drooping. Fls. small, creamy white, in large much-branched panicles. Fruit a berry.

* *C. australis*. Cabbage Tree. 40 E Stem branches after reaching flowering stage. Ls. 36×3 . Berry white. New Zealand. (Fig. 39 A.)

* *C. indivisa* (*C. Hectori*). 25. E. Stem unbranched. Ls. 72×6 . Berry purplish blue. New Zealand.

DANAEA RACEMOSA (*D. LAURUS*). Alexandrian Laurel. 4. June-July E. Ls. ov., lanc., 4, entire, bright green on both sides, hairless, stalkless. Fls. small, white or greenish yellow, in small terminal racemes. Fruit a berry, $\frac{1}{2}$, red. Asia Minor. (Fig. 38 A.)

* *LAPAGERIA ROSEA* Chilean Bell Flower. 15 June–October. E Climber. Ls. alternate, ov, 4, entire, pointed, heart-shaped or rounded base, dark glossy green, stiff and leathery, 3-5-nerved, short-stalked. Fls 3, crimson, bell-shaped, drooping, solitary or in few-flowered clusters in terminal l.-axils. Fruit 2, egg-shaped, 3-sided. Chile (Fig. 38 B)

* *PHILESIA BUXIFOLIA* 3 September–October E. Branchlets angled, hairless Ls alternate, lanc or oblong, $1\frac{1}{2}$, entire, stiff, dark green above, grey-green below, with green midrib, margins recurved, terminated by a beak which is often yellow. Fls. 2, rosy red, solitary at end of shoot Fruit a berry. South Chile. (Fig. 38 c.)

PHORMIUM. Ls. long, linear or awl-shaped, entire, pointed, green, keeled, very tough, rising in a tuft at ground-level. Fls 2, in large panicle.

* *P Colensoi* Mountain Flax. 5. Summer E. Ls. 60×2 , pale green Fls yellow or yellowish red. Seed vessel twisted New Zealand (Fig 40 A.)

Variety *variegatum*. Variegated form

* *P tenax* New Zealand Flax. 9 Summer. E. Ls. 108×5 , dark green, margins red or orange-coloured Fls red Seed vessel not twisted. New Zealand.

Variety *alpinum*. Dwarf.

Variety *purpureum* Ls purple.

Variety *variegatum* Ls. striped with yellow.

Variety *Veitchii* Ls. with broad yellow stripe down middle.

RUSCUS. Stems green. Ls alternate, entire, pointed, set in vertical plane (are really l.-like branches), stiff and leathery. Fls $\frac{1}{4}$, solitary or in few-flowered clusters in centre of 'leaf.' Fruit a red berry

R. aculeatus. Butcher's Broom 3. March–April. E Stems grooved, branched. Ls. ov., $1\frac{1}{2}$, spine-tipped. Fls. white. Europe (including Britain). (Fig. 38 F.)

R. hypoglossum. $1\frac{1}{2}$. March–April. E. Stems unbranched. Ls ov., lanc, 4, not spine-tipped. Fls. yellowish, in axil of l.-like bract on upper surface of 'leaf.' South Europe. (Fig. 38 G.)

R hypophyllum. 1. March–April. E. Stems unbranched. Ls. ov., $2\frac{1}{2}$, not spine-tipped. Fls. white, in small cluster in axil of minute bract on upper surface of 'leaf' South-west Europe and North Africa.

SMILAX. Climbers with prickly stems. Ls alternate, ov, entire, pointed, heart-shaped base, palmately veined, hairless, a pair of tendrils at base of l.-stalk. Fls. small, greenish yellow or white. Fruit a berry.

S. aspera. Rough Bindweed August–September. E. Stems zigzagged, angled. Ls. 4, often prickly on margins and midrib below. Fls. in terminal and axillary racemes. Berry red. Mediterranean region. (Fig. 38 D.)

S. hispida. Hag Brier. June. D. Stems very bristly. Ls 6, sometimes straight or tapering. Fls. in axillary clusters, stalk of cluster longer than l.-stalk. Berry black. North America.

S. rotundifolia. Horse Brier. June. D. Stems 4-angled, with a few short prickles between joints. Ls. nearly circular, 3. Fls in axillary clusters, stalk of cluster not longer than l.-stalk. Berry bluish black. North America. (Fig. 38 E.)

YUCCA. Ls. long, linear, or awl-shaped, pointed, glaucous, crowded radially in a tuft at the top of a short stem which is often so short as to be scarcely visible. Fls. large, white, bell-shaped, drooping, in large erect terminal panicles or racemes. Fruit a capsule

(a) *Ls flaccid, recurving*

- Y. flaccida*. July–August E Stem not rising above ground-level Ls. 20×1 , with marginal threads Panicle up to 6 feet high. South-east United States
Y. recurvifolia 8 August–September E. Ls. 36×2 , spine-tipped. Panicle up to 3 feet high. South United States. (Fig. 38 M.)

(b) *Ls stiff*

- Y. filamentosa* July–August E. Stem not rising above ground-level. Ls. 30×2 , margins with curly threads Panicle up to 6 feet high. South United States
Y. glauca. July–August E Stem not rising above ground-level. Ls. $30 \times \frac{1}{2}$, margins white. Panicle narrow (raceme), up to 4 feet high. South United States.
Y. gloriosa Adam's Needle. 8 August–September. E. Ls. 24×3 , spine-tipped. Panicle up to 4 feet high. South United States. (Fig. 38 L.)

Family 105 PALMAE $P_3+3, A_3+3, G(3)$ or 3

CHAMAEROPS (TRACHYCARPUS). Stem erect, covered by dark stiff fibres Ls large, palmately dissected into narrow segments, stalk 2-edged, toothed; crowded radially at and near top of stem Fls. small, yellow, in large panicles near top of stem Fruit a berry, $\frac{1}{2}$, blue-black.

C. excelsa (*C. Fortunei*) Chusan Palm. 30. Summer. E. Ls. 30, dark green. Japan (Fig 6 B)

C. humilis. Dwarf Fan Palm 8. Summer. E. Ls 18, greyish green. Mediterranean region.

* JUBAEA SPECTABILIS. Wine Palm. 50. E. Trunk bare, with numerous small vertical cracks. Ls. 15 feet long, pinnate; lfts. up to 2 feet long. Chile. (Fig. 17 A)

Family 106. GRAMINEAE. P_0, A_1-6, G_1

Stems jointed, usually hollow. Ls. alternate, linear or lanc., pointed, usually entire, base continued into a sheath which envelops stem. Fls. in spikes, racemes, or panicles, composed of small spikelets, each containing one or more fls. Each spikelet is made up of several alternate scales or bracts, the outer (glumes) being empty, the inner (paleas) bearing fls. Anthers long and hanging loose. Ovary with feathery stigmas.

ARUNDINARIA. Hardy Bamboo. Stems straight, cylindrical, with whorled branchlets; sheath open on one side and usually deciduous. The plant flowers very rarely, after which it dies. Stamens three.

ARUNDINARIA—continued

(a) *Stems purplish brown*

- A. anceps*. Ringal 15 E. Stems erect, arching at top. Sheath mottled inside, hairy on margin. Ls. $4 \times \frac{1}{2}$. North-west Himalaya. (Fig 40 B)
- A. auricoma*. 4. E. Stems very thin. Ls. 8×1 , rounded or heart-shaped at base, striped with yellow. Japan. (Fig 40 C)
- A. marmorea* 5 E. Stems solid, erect, clasped by persistent mottled sheaths. Ls. $5 \times \frac{1}{2}$, apex constricted about $\frac{1}{2}$ inch from top. Japan
- A. nitida* 10. E. Stems arching at top. Ls. $3 \times \frac{1}{4}$, with tapering base. China. (Fig 40 G)
- A. palmata* 8 E. Ls. 12×3 , spreading palm-like from end of branch. Japan (Fig. 40 D)

(b) *Stems green or yellow*

- A. angustifolia*. 6. E. Stems erect, very thin. Ls. $6 \times \frac{3}{4}$, rounded at base, bristle-toothed on one margin, sheath with tuft of erect hairs at top. Japan
- * *A. falcata* Ringal 10 E. Young stems covered with bloom. Ls. $4 \times \frac{1}{2}$, curved, without cross veinlets, rows of transparent dots between veins. Himalaya (Fig 40 E)
- * *A. Falconeri* Ringal 25. E. Stems purple at joints, sheath purple. Ls. $4 \times \frac{1}{2}$, no cross veinlets. Himalaya
- A. fastuosa*. 25 E. Stems stout, erect; sheaths up to 9×4 , glazed inside. Ls. 8×1 , tapering base. Japan (Fig. 40 J)
- A. Fortunei*. 3. E. Stems very slender, sheaths persistent. Ls. 7×1 , rounded base, striped with white, hairy on both sides. Japan.
- A. graminea* 10. E. Stems slender, very hollow; branchlets in dense whorls at top. Ls. $9 \times \frac{1}{2}$, tapering base. Japan. (Fig 40 H)
- A. japonica*. 15. E. Stems erect, very hollow, sheath with long tail-like point. Ls. 12×2 , long-pointed. Japan. (Fig 40 F)
- A. Ragamowskii* (*Bambusa tessellata*). 3. E. Stem sheaths covering several joints. Ls. 18×4 . China.
- A. Simonii*. 18 E. Stems very hollow; sheaths rather persistent, hairy on margins, very glazed inside. Ls. 12×1 , long-pointed, bright green above, glaucous on one side of midrib below. China.

Variety *Chino*. 4. Ls. $6 \times \frac{1}{2}$, dark green mottled with dull yellow.

ARUNDO DONAX Great Reed. 10. July–August. E. Stems hollow. Ls. alternate, awl-shaped, $24 \times 1\frac{1}{2}$, long-pointed, drooping, in two opposite rows, base of blade clasping stem. Fls. in erect silky panicles up to 24 long. Mediterranean region, India, etc. (Fig. 39 D.)

* BAMBUSA Bamboo. Not distinguishable from *Arundinaria*, except in the fl., which is rarely seen, and has six stamens (*Arundinaria* has three). The two hardy species given below are, however, clearly distinguishable.

B. disticha. 2. E. Stems slender, zigzagged. Ls. $2 \times \frac{1}{4}$, in two opposite rows. Japan. (Fig 40 K)

B. quadrangularis. 30. E. Stem 4-sided, with rounded corners. Ls. 8×1 , margins bristly. China and Japan.

CORTADERIA (GYNERIUM) ARGENTEA. Pampas Grass. 14. August–October. E. Ls. $60 \times \frac{1}{2}$, arising in a dense tuft from or near ground-level, rough to the touch

owing to the midrib and margins being finely toothed. Fls. in several erect plume-like silvery panicles rising from centre of tuft; spikelet with two or more fls. South America. (Fig. 39 B.)

EULALIA (*MISCANTHUS*) *JAPONICA*. 6. E. Stems herbaceous, green. Ls. linear, 12×1 , entire, green with white midrib. Fls. in large purplish brown panicles, erect at first but later bending over. Japan.

Variety *variegata*. Ls. striped with white.

Variety *zebrina*. Ls. with cross-bars of yellow or white. (Fig. 39 c.)

PHYLLOSTACHYS. Hardy Bamboo. Stems woody, zigzagged, flattened above joints. Like *Arundinaria* and *Bambusa*, the plant flowers very rarely, after which it dies; stamens three. (Fig. 40 L.)

(a) *Stems yellow*

P. aurea. 15. E. Stems stiff, erect, a swollen band below each joint. Ls. 4×1 . Japan.

P. Castillonis. 10. E. Stems very hollow, dark green on flattened parts. Ls. $5 \times \frac{3}{4}$, usually striped with yellow. Japan.

P. mitis. 20. E. Stems arching. Ls. $5 \times \frac{3}{4}$. Japan.

(b) *Stems not yellow*

P. flexuosa. 8. E. Stems green, then black; margin of sheath not hairy. Ls. $4 \times \frac{1}{2}$. Japan.

P. Henonis. 15. E. Stems very hollow, arching outwards. Ls. $3 \times \frac{1}{2}$, tufted. Japan.

P. nigra. 20. E. Stems very hollow, green at first, then black; margin of sheath hairy. Ls. tufted, $3 \times \frac{1}{2}$. Japan.

P. Quiloi. 20. E. Stem-sheaths conspicuously mottled. Ls. in tufts, 8×1 . Japan.

P. viridi-glaucescens. 20. E. Stems very hollow, arching, branched from base; sheaths striped with purple. Ls. 5×1 . China.

CLASS III. GYMNOSPERMS

Ovules not enclosed in an ovary. More often than not several ls. appear together when the seed germinates. The ls. which follow do not usually have a network of branching veins. Families 108 and 109 are commonly known as Conifers, in which the ls. are linear or awl-shaped, and the plants full of resin, but the typical woody cone is not found in *Taxaceae* and *Juniperus*.

Family 107. *GNETACEAE*. P2-4, A2-8, G1

EPHEDRA. Shrubby Horse-tail. Branchlets green, opposite or whorled, slender, rush-like. Ls. distant, opposite or whorled, usually minute, united at base, and often reduced to a mere sheath. Fls. small, yellow, unisexual, in small racemes from joints. Fruit usually a berry.

(a) *Ls. minute, scale-like*

E. distachya. 4. Spreading mass of bright green cylindrical upright branches. Berry red. Europe and Asia Minor. (Fig. 37 J.)

E. Gerardiana (*E. vulgaris*). 2. Like above, but dwarfer. Not more than four fls. in male racemes. Himalaya.

(b) *Ls. awl-shaped*

E. foliata. 30. Climbing or prostrate. Ls. 1. Berry red or whitish. Arabia, Persia, Turkestan.

E. trifurca. 3. Stems rigid, spiny. Ls. $\frac{1}{2}$. Fruit dry, with winged bracts. South United States. (Fig. 37 K.)

Family 108. *TAXACEAE*

Resinous plants with linear or scale-like ls. Fls. without perianth, unisexual, sexes usually on different trees. Fruit fleshy, usually 1-seeded.

CEPHALOTAXUS. Main branches whorled in young trees; branchlets opposite. Ls. alternate, linear, pointed, two broad grey bands below; usually in two rows. Male fls. yellowish, in l.-axils on lower side of branch. Fruit 1, egg-shaped.

C. drupacea. Cow's Tail Pine. 12. E. Ls. 2, abruptly pointed, directed upwards forming a V-shaped trough. Fruit green. Japan. (Fig. 41 A.)

Variety *fastigiata*. Erect habit; ls. not in two rows.

Variety *pedunculata*. Ls. up to $2\frac{1}{2}$.

C. Fortunei. 20. E. Ls. 3, long-pointed, horizontal. Fruit brown. China. (Fig. 41 B.)

DACRYDIUM. Ls. scale-like, awl-shaped, or linear. Fruit a fleshy cup, containing one seed.

* *D. cupressinum*. 80. E. Branches long, thin, and drooping. Ls. of young

DACRYDIUM—*continued*

trees awl-shaped, $\frac{1}{2}$, completely covering stem; scale-like on older trees. New Zealand. (Fig. 41 H.)

* *D. Franklmu.* Huon Pine. 100. E. Branches arching. Ls. minute, scale-like, keeled, giving 4-sided shape to branchlet New Zealand.

* *PHYLLOCLADUS TRICHOMANIODES*. 50. E. Bark thick, black outside, reddish inside. Branches whorled Ls. alternate, ov, 1, toothed or lobed, in two opposite rows giving a rather fern-like appearance to branchlet. Fruit fleshy, enclosing nut-like seed. New Zealand. (Fig. 34 M)

PODOCARPUS. Ls. alternate, linear, pale green below, not 2-ranked. Fruit a 1-seeded berry on a short stalk

P. alpina 4. E. Branchlets whorled. Ls. $\frac{1}{2}$, blunt-ended. Fruit $\frac{1}{4}$, red. Victoria and Tasmania. (Fig. 41 D.)

P. chilna 30 E. Ls. $4 \times \frac{1}{4}$, fine-pointed, tapering at both ends. Fruit $\frac{1}{4}$. Chile. (Fig. 41 C.)

P. macrophylla. 30. E. Ls. $4 \times \frac{1}{4}$, abruptly pointed or blunt, tapering at both ends, midrib prominent below. Fruit $\frac{1}{4}$, green or purplish. China and Japan

* *P. Totara*. 80. E. Ls. 1, stiff, sharp-pointed. Fruit $\frac{1}{2}$, red. New Zealand. (Fig. 41 E.)

PRUMNOPITYS ELEGANS (PODOCARPUS ANDINA). Plum-fruited Yew. 50. E. Ls. alternate, $\frac{1}{2}$, flattened, dull grey-green below, 2-ranked. Fruit $\frac{3}{4}$, a 1-seeded berry, yellowish white. Chile. (Fig. 41 G.)

SAXEGOTHEA CONSPICUA. Prince Albert's Yew. 40. E. Branchlets whorled. Ls. alternate, linear, 1, indistinctly 2-ranked. Fruit $\frac{1}{2}$, a small fleshy cone with several seeds. South America (Fig. 41 F.)

TAXUS BACCATA. Yew. 40. E. Bark peeling; branchlets alternate. Ls. alternate, linear, 1, dark green above, bright green below, 2-ranked. Fruit $\frac{1}{4}$, a red fleshy cup containing one seed. Europe (including Britain), West Asia, Himalaya. (Fig. 41 J.)

Variety *fastigiata*. Irish Yew. Stems and branchlets erect; ls. $1\frac{1}{2}$, not 2-ranked but spreading radially.

TORREYA. Main branches whorled in young trees; branchlets opposite. Ls. alternate, linear, sharp-pointed, two narrow grey bands in grooves below, 2-ranked. Fruit a dryish egg-shaped 1-seeded berry.

T. californica (*T. Myristica*). Californian Nutmeg. 70. E. 2-year-old branchlets brown. Ls. 2, or more. Fruit $1\frac{1}{2}$, green streaked with purple. California.

T. grandis. 70. E. 2-year-old branchlets green. Ls. 1. Fruit 1, green. China.

T. nucifera. 30. E. 2-year-old branchlets brown. Ls. 1. Fruit 1, green. Japan. (Fig. 41 K.)

Family 109. PINACEAE

Resinous trees with linear, awl-shaped or scale-like ls. Male and female fls. usually on same tree. Fruit a cone with several or many scales, usually woody (fleshy in *Juniperus*), seeds attached to scales.

ABIES. Silver Fir. Tall narrow evergreen trees with pointed crowns. Bark

ABIES—continued

greyish white or greyish green; branches whorled in young trees, main branchlets opposite Ls alternate, linear, generally with two white bands below; spirally arranged on leading shoots, usually 2-ranked on older ones, leave round scars when they fall Male catkins drooping; female erect, egg-shaped Cones woody, erect, the scales dropping off leaving central axis on branch.

(a) *Ls. all radially arranged*

- A. cephalomca* Grecian Fir. 100 Ls 1, flattened, long- and sharp-pointed. Cone cylindrical, $6 \times 1\frac{1}{2}$, bracts protruding and bent downwards. Mountains of Greece.
- A. Pinsapo*. Spanish Fir. 100. Ls $\frac{3}{4}$, short-pointed or blunt. Cone cylindrical, $5 \times 1\frac{1}{2}$, bracts not protruding. Mountains of Spain. (Fig. 41 M.)
- Variety *glauca*. Ls. blue-grey.
- Variety *pendula*. Branches drooping.

(b) *Ls. in two approximately horizontal rows*

- A. bracteata* (*A. venusta*) Santa Lucia Fir 150 Buds spindle-shaped, light brown, not resinous. Ls 2 or more, rigid, sharp-pointed. Cone 4×2 , egg-shaped, purplish brown, bracts spine-tipped California. (Fig. 41 L.)
- A. grandis*. Giant Fir. 250. Branchlets hairless, olive-green; buds small, resinous. Ls. 2, glossy green, blunt-ended, not grooved above. Cone 4×2 , cylindrical, bright green. West North America. (Fig. 41 N.)
- A. Lowiana*. 200. Ls. 2, bluish- or greyish-green, grooved above. South Oregon to California.
- A. pectinata* (*A. alba*). Common Silver Fir. 120. Branchlets grey, downy; buds not resinous. Ls. 1, glossy green. Cone 6×2 , reddish brown. Europe. (Fig. 42 A.)
- A. sibirica* Siberian Fir. 100. Like *A. pectinata*, but buds resinous and ls. directed forwards. Cone 3, with toothed scales. North Asia.
- Variety *nephrolepis*. Ls. and cones smaller.

(c) *Ls. in two rows with V-shaped trough between*

- A. balsamea*. Balsam Fir. 60. Branchlets grey, smooth, with scattered hairs; buds small, egg-shaped or round, resinous. Ls. 1, slightly notched at apex, grey below. Cone 3×1 , dark purple or olive-green. Canada. (Fig. 42 B.)
- A. brachyphylla* (*A. homolepis*). Nikko Fir. 100. Branchlets grey, deeply grooved; buds egg-shaped or round, resinous. Ls. 1, slightly notched at apex, white below. Cone $4 \times 1\frac{1}{2}$, bracts hidden. Japan. (Fig. 42 C.)
- A. calicica*. See under (d).
- A. Delavayi*. 100. Branchlets reddish brown; buds round, resinous. Ls. 1, curved, grey below, margins recurved. Cone $2\frac{1}{2} \times \frac{3}{4}$, purplish black. China.
- A. firma*. 120. Ls. 1, pale green below (white bands indistinct). Cone 5×2 , bracts protruding. Japan. (Fig. 42 D.)
- A. Forrestii*. 65. Branchlets reddish brown; buds small, egg-shaped, resinous. Ls. 2, notched at apex, white below. Cone $3\frac{1}{2} \times 1\frac{1}{2}$, dark blue. China.
- A. Nordmanniana*. See under (d).

ABIES—*continued*

- A. numidica*. Algerian Fir 70. Branchlets brown, glossy, hairless; buds large, egg-shaped, not resinous. Ls $\frac{3}{4}$, dark glossy green above with grey patch near apex, white below. Cone $5 \times 1\frac{1}{2}$, bracts hidden. Algeria.
- A. Webbiana* (*A. spectabilis*). Himalayan Fir 200. Branchlets reddish brown; buds large, round, resinous. Ls 2, deeply notched at apex, white below. Cone 6×3 Himalaya. (Fig. 42 F)
- Variety *brevifolia*. Branchlets grey, ls 1, greyish below

(d) *Ls. in two rows without, or with indistinct, V-shaped trough between; straight or nearly so*

- A. amabilis*. 250 Branchlets grey, downy, buds round, resinous. Ls. $1\frac{1}{2}$, dark green above, vividly blue-white below. Cone $6 \times 2\frac{1}{2}$, purple. West North America. (Fig. 42 G)
- A. cilicica*. Cilician Fir. 100. Branchlets greyish brown, hairless or nearly so; buds rough, egg-shaped, not resinous. Ls 1, stiff and crowded, directed outwards, dark green above, grey below, not notched at apex. Cone 8×2 , bracts hidden. Asia Minor.
- A. holophylla*. Manchurian Fir 150. Branchlets grey, hairless, buds slightly resinous. Ls. 1, bright green above, grey bands below often indistinct. Cone 4×2 , bracts hidden. Manchuria.
- A. Mariesii*. 80. Branchlets reddish brown, very downy, buds round, resinous, purple. Ls $\frac{3}{4}$, yellowish green above, white below. Cone 4×2 , bracts hidden. Japan.
- A. Nordmanniana*. Caucasian Fir. 200 Buds egg-shaped, not resinous. Ls. 1, stiff and crowded, dark green and grooved above, grey below. Cone 6×2 , reddish brown, bracts protruding and bent downwards. Caucasus. (Fig. 42 E.)
- A. numidica*. See above (c).
- A. Veitchii*. 70. Branchlets brown, downy; buds round, resinous. Ls. 1, notched at apex, white below, all pointing forwards. Cone 2×1 , cylindrical, blue purple to brown. Japan (Fig. 42 H)

(e) *Ls. in two rows without V-shaped trough between; much curved, some white on upper as well as lower side*

- A. nobilis*. 200. Ls. 1, flattish, grooved above, notched at apex. Cone 10×3 , cylindrical, brown-purple, bracts protruding and bent back. Washington to North California. (Fig. 42 K.)
- Variety *glauca*. Ls. bluish green.
- A. magnifica*. Red Fir. 200. Ls. $1\frac{1}{2}$, 4-angled, not grooved above, not notched at apex. Cone 8×4 , purple to brown, bracts not protruding. Oregon to California. (Fig. 43 A.)

(f) *Ls. irregularly arranged*

- A. concolor*. 100. Branchlets hairless or nearly so; buds large, round, resinous. Ls. 3, glaucous green. Cone $4 \times 1\frac{1}{2}$, plum-coloured to brown, bracts not protruding. Colorado. (Fig. 43 C.)
- Variety *violacea*. Ls. bluish.
- A. lasiocarpa*. 90. Branchlets grey, downy; buds small, egg-shaped. Ls. $1\frac{1}{2}$, much crowded, pointing forward and upward, pale bluish green. Cone

ABIES—*continued*

4 × 2, cylindrical, bracts not protruding West North America.
(Fig. 43 B)

(g) *Ls* mostly erect on upper side of shoot

A. koreana Korean Fir. 60 *Ls*. 1, white below, broadest towards apex.
Cone $2\frac{1}{2} \times 1$, purple Korea (Fig. 42 J)

ARAUCARIA. Main branches whorled, branchlets opposite. *Ls*. alternate, awl-shaped Male catkins in clusters at end of branches Cones falling when ripe.

* *A. excelsa*. Norfolk Island Pine 150. E. Bark peeling. *Ls* on young branchlets, $\frac{1}{2}$, spreading, on older branchlets $\frac{1}{4}$, incurved. Cone 4, seeds 1, winged Norfolk Island and Pacific. (Fig. 43 F.)

A. imbricata (*A. araucana*). Chile Pine, Monkey Puzzle. 80. E. *Ls* 2 × 1, leathery, spine-tipped, overlapping spirally, green on both sides, very crowded. Cone 6, seeds $1\frac{1}{2}$, conical, wingless. Chile (Fig. 43 E)

ATHROTAXIS. Branches alternate *Ls* alternate, scale-like or awl-shaped, closely and spirally arranged Male and female catkins on same tree. Cones small

* *A. cupressoides*. Tasmanian Cedar 40 E. *Ls* minute, scale-like, blunt-ended except on oldest branches where they are sharp-pointed and much larger, closely pressed to stem. Cone $\frac{1}{4}$. Tasmania (Fig. 43 K)

* *A. laxifolia*. Tasmanian Cedar 30 E. *Ls* minute, scale-like, with incurved points, free from stem Cone $\frac{1}{2}$ Tasmania (Fig. 43 H.)

* *A. selaginoides*. King William Pine 100. E. *Ls* awl-shaped, $\frac{1}{2}$, sharp-pointed, keeled, two white bands below Cone 1. Tasmania (Fig. 43 J)

* *CALLITRIS OBLONGA*. Cypress Pine 25. E. *Ls*. minute, scale-like, in threes on slender feathery branches. Cone $1 \times \frac{3}{4}$, egg-shaped, 6-scaled, seeds winged. Tasmania (Fig. 43 L.)

CEDRUS. Cedar. Strongly resinous. Branches alternate. *Ls*. linear, alternate and spirally arranged on leading shoots, in clusters on older shoots, persistent for several years Male catkins 2, cylindrical, erect; female $\frac{1}{2}$, egg-shaped, purple. Cones erect, purple when young; scales fan-shaped, horizontal and closely packed like the leaves of a book, falling and leaving central axis on branch.

C. atlantica. Atlas Cedar. 120. Leading shoot stiff and erect. *Ls*. 1. Cone 3×2 , cylindrical. North Africa. (Fig. 44 B.)

Variety *glauca*. *Ls*. silvery.

C. Deodara. Deodar. 250. Leading shoot and branches drooping. *Ls*. 2. Cone 4×3 , egg-shaped. Himalaya. (Fig. 44 A.)

Variety *glauca*. *Ls*. silvery.

C. Libani (*C. libanotica*). Cedar of Lebanon. 120 Leading shoot arching, branches horizontal or slightly drooping. *Ls*. 1. Cone $5 \times 2\frac{1}{2}$, cylindrical. Mountains of Syria. (Fig. 44 C.)

Variety *argentea*. *Ls*. silvery.

CRYPTOMERIA JAPONICA. Japanese Cedar. 150. E. Bark reddish brown, peeling. *Ls*. alternate, awl-shaped, $\frac{3}{4}$, curved inwards Male catkins $\frac{1}{4}$, terminal. Cone $\frac{1}{2}$, round, at end of branches. Japan. (Fig. 44 D.)

Variety *elegans*. *Ls*. 1, spreading, turning brown in winter.

CUNNINGHAMIA SINENSIS (*C. lanceolata*). 150. E Ls. alternate, linear, 2, flat, pointed, margins finely toothed, green above, two white bands below, 2-ranked. Cone roundish, 1½, cone-scales toothed. China. (Fig 44 F.)

CUPRESSUS. Cypress. Ls opposite, of two kinds (1) Juvenile form linear or awl-shaped, sometimes found on parts of older plants; (2) Adult form scale-like and closely pressed to stem Cones round, woody; scales peltate, with central boss.

(a) *Branchlet systems flattened Cones small (½ inch or less)* CHAMAECYPARIS

* *C. formosensis*. Formosan Cypress. 150 E Branches horizontal Ls pointed, without white markings Cone ½, egg-shaped According to Dallimore it is like *C. nootkatensis* (see below), but branchlet systems paler green and often tinged with bronze Formosa. (Fig. 44 G.)

C. funebris. Chinese Weeping Cypress 70 E. Bark smooth; branches ascending or horizontal with long drooping ends. Scale ls. pointed, furrowed on back, without white markings. Cone ½ West China (Fig. 44 K)

C. Lawsonsiana Lawson's Cypress 200 E Scale ls. pointed, with small glands on back and vague white markings (as if edged with white). Male fls. red, at end of branchlets. Cone ¼. West North America. (Fig. 44 H)

Variety *Allumii*. Tall and thin, with grey ls.

Variety *argentea*. Silvery.

Variety *Boskoopii* Triumph. Blue-grey.

Variety *erecta viridis*. Narrow, branchlets all erect, ls. bright green.

Variety *Fletcheri* Blue-grey, ls all juvenile.

Variety *filifera* Long drooping cord-like branches. (Fig. 44 J.)

C. nootkatensis (*Thuyopsis borealis*). Nootka Cypress. 120. E. Scale ls. long-pointed, without glands or white markings. Branchlet systems in a somewhat vertical plane Cone ½. South-west Alaska to Oregon. (Fig 44 L)

Variety *lutea*. Young shoots yellow.

C. (Retinospora) obtusa Hinoki Cypress 120. E. Scale ls. blunt, without glands on back, but with X- and Y-shaped white markings. Cone ¼. Japan. (Fig. 44 M)

Variety *aurea*. Young shoots yellow.

Variety *lycopodioides*. Dwarf. Branchlet systems not quite flat.

C. (Retinospora) pisifera. Sawara Cypress 100. E. Scale ls. sharply pointed, with white markings on back; juvenile ls. usually present on parts of older trees. Cone ¼. Japan. (Fig. 44 N.)

Variety *aurea*. Young shoots yellow.

Variety *filifera*. Branches long and cord-like.

Variety *plumosa*. Ls. all juvenile. (Fig. 44 O.)

Variety *plumosa argentea*. Ls. all juvenile, creamy white.

Variety *plumosa aurea*. Ls. all juvenile, yellow.

Variety *squarrosa*. Ls. all juvenile, silvery; outline of bush very irregular. (Fig. 44 P.)

CUPRESSUS—continued

C. thyoides. 50 E Scale ls very small, dark green, with large glands on back and with either X-shaped or no white markings Cone very small ($\frac{1}{4}$ or less) East North America.

(b) *Branchlet systems not flattened* Cones large
(usually 1 inch or more)

C. arizonica. Arizona Cypress. 40 E. Bark peeling in thin papery flakes. Scale ls. pointed, with conspicuous glands and often white on back, very closely pressed to stem Cone 1 Arizona. (Fig 44 R)

C. lusitamica Cedar of Goa 50 E Branchlets 4-sided Scale ls. sharply pointed, free at tip Cone $\frac{1}{2}$ Mexico

C. macrocarpa Monterey Cypress 90. E. Branchlet systems bright fresh green. Scale ls swollen at tip Cone $1\frac{1}{2}$. Bay of Monterey (California). (Fig. 44 S)

Variety *fastigiata* Branchlets erect.

Variety *lutea* Ls yellow

C. sempervirens. Italian Cypress 150 E Branchlet systems dark dull green. Scale ls not swollen at tip, very small. Cone 1. South Europe and North Persia.

Variety *stricta* (*fastigiata*, *pyramidalis*) Branchlets erect, a thin narrow tree.

FITZROYA PATAGONICA (*F. cupressoides*). 50. E. Ls in whorls of three or four, linear, $\frac{1}{4}$, blunt-ended, two white bands on upper side Cone $\frac{1}{4}$, round, at end of branchlets South America (Fig 44 T.)

* FOKIENIA HODGINSII. 50 E Ls scale-like, in fours on flattened 3-pinnate branchlet systems Cone 1, round, 12-16-scaled, seed with two unequal wings. Fukien province, China. (Fig. 44 V)

GLYPTOSTROBUS SINENSIS (*G. pensilis*). Chinese Deciduous Cypress 100. D. Like *Taxodium*, but cone scales elongated and not peltate According to Henry 'is readily distinguished from *Taxodium* in all stages of growth by the numerous stomatic white dots on the branchlets of the first, second, and third year.' China.

JUNIPERUS Juniper Ls. opposite or in threes, awl-shaped or scale-like. Cones fleshy, berry-like

(a) *Ls. awl-shaped and needle-like, in threes, spreading,*
jointed at base

J. communis. Common Juniper. 30. E. Ls. $\frac{1}{2}$, sharp-pointed, with one grey band above Berry $\frac{1}{4}$, blue-black. Europe (including Britain), Asia, North America. (Fig. 44 W.)

Variety *aurea*. Young shoots yellow.

J. formosana. 40. E. Branches drooping at ends Ls. $\frac{3}{4}$, 1-banded and grooved above. Berry $\frac{1}{4}$, brown. Japan.

J. macrocarpa. Large-berried Juniper. 12. E. Ls. $\frac{3}{4}$, 2-banded above. Berry $\frac{1}{2}$, brown. Spain to Syria.

J. rigida. 30. E. Branches drooping at ends. Ls. $\frac{3}{4}$, 2-banded and not grooved above. Berry $\frac{1}{4}$, dark brown. Japan.

JUNIPERUS—continued

(b) *Ls. awl-shaped and needle-like, in threes, directed upwards, not jointed at base*

- J. procumbens* Creeping Juniper E Ls $\frac{1}{4}$, bluish grey with one green band above Japan
J. recurva Himalayan Juniper 40. E Usually a low shrub with long creeping stems. Ls. $\frac{1}{4}$, bluish grey without green band above Berry $\frac{1}{4}$, brown to purple Himalaya (Fig. 44 Y.)
J. squamata 2. E. Like *J. recurva*, but ls. bright green. Himalaya.

(c) *Ls. mostly scale-like*

- J. chinensis* Chinese Juniper. 60 E. Bark twisted, peeling in long strips In the male tree the lower branches are furnished with 2-banded needle-like ls in threes; in the female the ls. are scale-like except on small side shoots and lower branches. Berry $\frac{1}{4}$, white with bloom when ripe China (Fig. 44 X.)
 Variety *albo-variegata*. Shoots creamy white at tips.
 Variety *aurea* Young shoots yellow.
 Variety *glauca* Ls. bluish grey.
 Variety *Sargentii* Prostrate form.
J. excelsa Grecian Juniper. 40. E Bark peeling in long strips; branches curved up at ends. Needle ls in opposite pairs, 2-banded, rarely present on adult trees. Berry $\frac{1}{4}$, dark brown with blue bloom. Greece and Asia Minor.
J. occidentalis Western Juniper 50 E. Bark bright cinnamon-red, scaly. Scale ls in threes, closely pressed to stem, grey-green Berry $\frac{1}{4}$, bluish black, bloomy. West North America
J. phoenicea. 18. E. Branchlets tufted at ends Scale ls. in threes, minutely toothed, needle ls 2-banded, in threes Berry $\frac{1}{4}$, yellowish or reddish brown Mediterranean region
J. Sabina. Savin. 6. E Spreading; strongly aromatic when bruised. Needle ls. in opposite pairs, 1-banded Berry $\frac{1}{4}$, dark brown covered with blue bloom. Central and South Europe. (Fig. 44 ZZ)
J. thurifera. Incense Juniper, Spanish Juniper. 40. E. Needle ls. in opposite pairs, 2-banded. Berry $\frac{1}{4}$, blue. Spain and North Africa.
J. virginiana. Red or Pencil Cedar. 100. E. Bark reddish brown, peeling in strips Needle ls in opposite pairs, 1-banded. Scale ls pointed, in opposite pairs Berry $\frac{1}{4}$, blue, ripe in one season. North America. (Fig. 44 Z.)
 Variety *glauca* Silver Juniper.

KETELEERIA. Like *Abies*, but adult ls. keeled on both sides and pale green below; buds with keeled scales. Ls. on young trees up to $2\frac{1}{2}$, spiny-pointed. Cone 8×2 , erect, scales do not fall off.

K. Davidiana. 100. E. Branchlets yellowish grey, hairy. China and Formosa. (Fig. 43 D.)

K. Fortunei. 80. E. Branchlets orange-red, hairless. South-east China.

LARIX. Larch. Branches alternate. Ls. linear, deciduous, in clusters on old shoots, spirally arranged on leading shoots, pale green. Male fls. solitary, yellow,

LARIX—continued

round or cylindrical, female catkins round, red or purple, erect Cones small, woody

- L. americana* (*L. laricina*) Tamarack 80 Branchlets reddish brown Ls 1, 3-sided, very narrow, bright green Cone $\frac{1}{2}$, egg-shaped East North America.
L. europaea (*L. decidua*) Common Larch. 150. Branchlets yellowish grey, hairless. Ls $1\frac{1}{2}$, bright green, soft. Female catkins purple. Cone $1\frac{1}{2}$. Europe (Fig 45 A.)
L. Griffithii. Sikkim Larch 60 Branchlets long and drooping Ls. 1 Female catkins purple Cone 3×1 . East Himalaya
L. leptolepis (*L. Kaempferi*) Japanese Larch. 100. Branchlets reddish brown. Ls $1\frac{1}{2}$, with two white bands below Female catkins red Cone 1×1 . Japan.
L. occidentalis 200 Bark reddish Ls $1\frac{1}{2}$ Cone $1\frac{1}{2} \times \frac{3}{4}$, with conspicuous bracts West North America (Fig. 45 B)

LIBOCEDRUS DECURRENS Incense Cedar. 120 E A tall narrow tree with erect branches and dense foliage Bark chocolate colour, scaling off in small rectangles. Branchlet systems flattened, green on both sides, set in vertical plane. Ls in fours, scale-like, with long tapering bases, dark green Cone $\frac{3}{4}$, erect, elongated, 4-scaled, seeds winged West North America (Fig 44 U)

PICEA Spruce. Tall narrow evergreen trees with pointed crowns. Bark scaly, grey or greenish, often with a bronze or pinkish tinge; branches whorled in young trees, main branchlets opposite Ls alternate, linear, leaving small pegs on the branchlet when they fall. Male catkins in l.-axils at end of shoots, yellow or red; female terminal, green or purple. Cones hanging.

(a) *Ls. flattened or distinctly 2-edged, with grey lines on one side only*

- P. brachytyla*. 80. Ls on upper side of shoot only, $\frac{3}{4}$, dark green above, bluish grey below Cone 4×2 , scales not toothed. China.
P. Breweriana. Weeping Spruce. 100. End of branchlet hangs perpendicularly. Ls 1, radially arranged. Cone 3, light orange-brown, scales rounded and entire. West North America. (Fig 45 G.)
P. jezoensis (*P. ajanensis*) Yeddo Spruce. 150. Ls. on upper side of shoot only, 1, blunt, dark green above, vividly blue-white below. Cone 2×1 , scales toothed Japan.
P. Omorika Serbian Spruce 100. Buds enclosed by ring of awl-shaped scales. Ls 1, thick, directed at different angles on central upper part of shoot Cone 2, egg-shaped, scales toothed. South-west Serbia. (Fig. 45 C.)
P. sitchensis (*Abies Menziesii*). Sitka Spruce. 200. Branchlets very stiff, yellowish brown, hairless. Ls 1, stiff and prickly-pointed, radially arranged, green on one side, silvery on the other. Cone 4×1 , blunt, pale brown. West North America. (Fig. 45 F.)

(b) *Ls. quadrangular in section; grey lines on both sides*

- P. alba* (*P. glauca*). White Spruce. 100 Branchlets hairless. Ls. $\frac{3}{4}$, with pale bluish green bloom. Cone 2, cylindrical; scales very thin, nearly entire. North America. (Fig. 45 D.)
P. asperata. 100. Branchlets yellowish grey Ls. $\frac{3}{4}$, radially arranged, leaving large pegs. Cone $4 \times 1\frac{1}{2}$, scales entire. China.

PICEA—continued

P. bicolor (*P. Alcockiana*). 80. Ls. $\frac{1}{2}$, very crowded, bright glossy green. Cone $3 \times 1\frac{1}{2}$, scales slightly toothed. Japan

P. Engelmannii 100 Branches drooping, branchlets downy Ls. 1, radially arranged. Cone 2×1 , tapering at top; scales toothed, cut off square at apex. West North America (Fig. 45 L.)

P. excelsa (*P. Abies*) Common Spruce, Norway Spruce, Christmas Tree. 120. Ls. $\frac{1}{2}$, vaguely 2-ranked, deep green Cone 5×2 , cylindrical, tapering at top; scales triangular, jagged at apex. Europe. (Fig. 45 E)

Variety *argentea spica* Young shoots creamy white

P. likiangensis 100 Branchlets brown, bristly, with prominent l.-pegs. Ls. 2-ranked, $\frac{1}{2}$, horny-pointed Cone 2, egg-shaped, with rounded wavy scales China.

P. Morinda (*P. Smithiana*). Himalayan Spruce. 120 Branches drooping. Ls. 2, prickly pointed, radially arranged and directed forward. Cone 6×2 , scales rounded, entire West Himalaya. (Fig. 45 K)

P. nigra (*P. Mariana*) Black Spruce. 30. Branches densely twiggy; branchlets covered with reddish down. Ls. $\frac{1}{2}$, slightly curved, dark bluish green. Cone 1. North America. (Fig. 45 H.)

P. obovata. Siberian Spruce. 100. Like *P. excelsa*, but cones smaller (3), and cone scales rounded and entire. North-east Russia and Siberia.

P. orientalis. 100 Ls. $\frac{1}{4}$, dark glossy green, pressed close to branchlet. Cone 2, scales toothed. Asia Minor and Caucasus. (Fig. 45 J)

P. polita. Tiger-tail Spruce 120. Branchlets creamy yellow, hairless. Ls. $1\frac{3}{4}$, sabre-like, stiff and prickly, curved and hollowed, glossy, radially arranged. Cone 4, scales minutely toothed. Japan. (Fig. 45 M.)

P. pungens. 100 Branchlets hairless; bud scales recurved at tip. Ls. radially arranged, 1, stiff, spine-tipped. Cone 4×1 , scales coarsely toothed. U.S.A.

Varieties *argentea* and *glauca* Ls. blue-white.

Variety *pendula* Blue weeping form.

PINUS Pines. Branches whorled in young trees; branchlets opposite. Ls. linear, in bundles of two to five. Male catkins yellow or red, clustered at base of either terminal or lateral young shoots; female egg-shaped, borne at end of lateral young shoots. Fruit a woody cone; cone scales thickened and bossed at outer end, opening when ripe and allowing the winged seeds to escape.

(a) Two ls. in each bundle

P. Banksiana. Jack Pine, Banksian Pine. 80. E. Buds thickly coated with resin. Ls. $1\frac{1}{2}$, bright green, curved and often twisted. Cone $1\frac{1}{2}$, curved. East North America. (Fig. 45 N.)

P. contorta. Beach Pine 30. E. Branchlets orange-brown. Ls. 2, dark green, rigid, twisted. Cone $2 \times \frac{3}{4}$, unequal-sided. West North America: (Fig. 45 P.)

Variety *Murrayana*. Lodge-pole Pine. Ls. 3, lighter green.

P. halepensis. Aleppo Pine. 50. E. Tree has a bare thin appearance. Branchlets pale grey; buds without resin. Ls. 4, very slender, bluish green. Cones 3×1 , stalked, in clusters, remaining on tree for several years. Mediterranean region.

PINUS—continued

- P. Laricio* (*P. nigra*). Corsican Pine. 150 E Buds cylindrical, thickly coated with resin; branchlets light brown, covered with long narrow plates Ls. 6, dark green, curved and twisted in young plants, minutely toothed. Cone 3×1 , egg-shaped, glossy Central Europe to West Asia. (Fig. 45 s.)
Variety *nigricans* (*austriaca*) Austrian Pine. Crowns broader and foliage greener and denser (cannot be seen through). Cone scale with radiating cracks (Henry)
- P. leucodermis* Bosnian Pine 90. E Branchlets greyish white; buds without resin Ls. 4, bright green, erect and rigid. Cone 3×1 , egg-shaped, yellow or light brown Yugo-Slavia.
- P. montana* (*P. Mugo*). Mountain Pine 80 E Usually a low shrub Densely branched Ls. 3, dull pale green, crowded Cone 2, glossy, very hard, with pyramidal scales. Alps. (Fig. 45 Q.)
Variety *pumilio* (*Mughus*). Dwarf. Cone $1\frac{1}{2}$
Variety *uncinata*. 80. Cone scales hooked
- P. muricata*. Bishop Pine 90 E. Branchlets orange-brown; buds cylindrical, coated with resin Ls. 6, stiff, blunt, concave, rough-edged. Cone 3, unequal-sided, scales hooked. California (Fig. 46 A)
- P. Pinaster* (*P. maritima*). Maritime Pine, Cluster Pine. 120. E. Bark deeply furrowed. Branchlets yellowish brown; buds without resin; scales free at tip, recurved and edged with silvery threads Ls. 8 Cone 5×2 , pointed, yellowish brown, in clusters remaining on tree for several years. Mediterranean region (Fig. 46 B.)
- P. Pinea*. Stone Pine. 100 E Old trees have broad umbrella-shaped crown. Buds $\frac{1}{2}$, scales curly, pointed, edged with silvery threads. Ls. 5. Cone 4×3 , roundish egg-shaped, not pointed, glossy, pale brown. Mediterranean region. (Fig. 45 R.)
- P. resinosa*. Red Pine. 70 E. Branches drooping; buds conical, resinous. Ls. 6, dark glossy green, rough-edged, densely crowded, bundle-sheath $\frac{3}{4}$. Cone egg-shaped, 2×1 , pale shining brown. East North America.
- P. sylvestris* Scots Pine 100. E Crown flattens out in old trees. Bark reddish, scaly, peeling off in upper part of tree. Bud with little resin, scales free at tip. Ls. 3, stiff, bluish green. Cone $2\frac{1}{2}$, conical. Europe (including Britain) and North Asia. (Fig. 45 O)
- P. Thunbergiana*. Japanese Black Pine. 100 E. Bark dark grey; branchlets yellow; buds white, not resinous. Ls. 3, stout, sharp-pointed, bright green. Cone 2×1 , each scale with small prickle. Japan.

(b) Three ls in each bundle

- P. Bungeana*. Lace-bark Pine 80. Bark smooth, ashy grey, peeling like plane. Ls. 3, rigid, bright pale green, rough-edged. Cone 2×1 , scales hooked, seeds wingless. China.
- P. Coulteri*. Big-cone Pine. 80 E. Branchlets very thick, with ls. clustered at end; buds resinous Ls. 12, minutely toothed, grey-green. Cone 12×6 , polished; scales thick, with strong hooked spines. California. (Fig. 46 E.)
- P. insignis* (*P. radiata*). Monterey Pine. 120. E Bark rough. Buds resinous. Ls. 6, thin, bright grass-green, clustered at end of branches on older

PINUS—continued

- trees. Cone 5×3 , unequal-sided, bright brown, boss of scale diamond-shaped with minute prickle in centre California (Fig. 46 L)
- P. palustris*. Southern Pitch Pine. 120 E. Bark light brown, peeling in thin scales; branches ascending, with ls. in tufts at end; buds whitish, not resinous. Ls. 16, dark green. Cone 8×2 , each scale with a short hook South-east United States.
- P. ponderosa* Western Yellow Pine. 200. E. Crown narrow, open and tufted; lower branches drooping, branchlets shining reddish brown, buds resinous. Ls. 12, 3-sided, densely crowded at end of branch on older trees Cone 6×2 , narrowly egg-shaped, scale with short hooked prickle. West North America (Fig. 46 F)
- Variety *Jeffreyi* (*P. Jeffreyi*). Buds not resinous. Ls. 8, bluish.
- P. rigida*. Northern Pitch Pine 80. E. Trunk with numerous small shoots in addition to the larger branches Branchlets pale brown, hairless; buds cylindrical, resinous. Ls. 4, rough-edged. Cone 1 to 3, round or conical, scales end in short prickle. East North America. (Fig. 46 C.)
- P. Sabiana* Digger Pine. 50 E. Young branchlets blue-white, with ls. clustered at end. Ls. 12, bluish green, drooping Cone 10×6 , very resinous, scales hooked. California.
- P. Taeda*. Loblolly Pine 120 E. Bark bright reddish brown, thick; branches spreading or ascending; buds resinous. Ls. 9, bright green Cone 4×2 , each scale with short hooked spine. East United States

(c) Five ls in each bundle

- P. aristata*. Bristle-cone Pine, Hickory Pine 50. E. Often a prostrate shrub. Branchlets light orange, hairless Ls. $1\frac{1}{2}$, dark green, with conspicuous white lines. Cone 3×2 , egg-shaped, scales with hooked bristles. California (Fig. 46 D.)
- P. Armandi* 60. E. Branchlets greyish green. Ls. 6, bright green, minutely toothed. Cone 8×3 , narrowly egg-shaped, seeds wingless. China
- P. Cembra* Arolla Pine, Cembran Pine. 100. E. Densely branched and very leafy. Branchlets covered with shaggy reddish brown hairs. Ls. 3, bright green, smooth-edged, crowded. Cone 3×2 , egg-shaped, not spiny. Alps. (Fig. 46 K)
- P. excelsa*. Bhutan Pine, Blue Pine. 150. E. Bark smooth and silver-grey on young tree. Branchlets glaucous green, hairless. Ls. 6, thin, drooping, bluish green, rough-edged. Cone $8 \times 1\frac{1}{2}$, hanging, slightly curved. Himalaya. (Fig. 46 H.)
- P. flexilis*. Limber Pine. 60. E. Branchlets long, slender and downy, can be bent double without breaking. Ls. 3, rigid, dark green. Cone $4 \times 1\frac{1}{2}$. Rocky Mountains. (Fig. 46 G.)
- P. Lambertiana*. Sugar Pine. 200. E. Bark smooth, ashy grey, full of resin. Buds $\frac{1}{2}$, blunt-ended. Ls. 4, bluish green, rough-edged, spirally twisted, white lines on back, clustered at end of branch. Cone 20×3 , hanging. West North America. (Fig. 46 M.)
- P. monticola*. Western White Pine. 125. E. Branchlets downy. Ls. 4, rigid, blunt, twisted, white on one side, rough-edged. Cone 8×1 , curved towards tip. West North America.

PINUS—continued

P. parviflora. Japanese White Pine. 40. E Branchlets minutely downy; buds $\frac{1}{4}$. Ls. 2. Cone $3 \times \frac{3}{4}$, in whorls in great profusion Japan. (Fig. 46 J)

P. Peuke Macedonian Pine 100 E. Narrow tree. Branchlets green, glossy, hairless Ls. 4, crowded, stiff, rough-edged Cone $5 \times 1\frac{1}{2}$. Balkan Mountains.

P. Strobus. Weymouth Pine 80 E Bark smooth and silver-grey on young trees. Branchlets with tufts of hairs at first below insertion of ls., not glaucous. Ls. 5, light green or bluish green, drooping, rough edged Cone 8×1 , curved East North America

PSEUDOLARIX FORTUNEI. Golden Larch 100 D Branches whorled Ls. linear, 2, pale green, in clusters at end of short curved side shoots; alternate and spirally arranged on leading shoots Male fls. yellow, in clusters at end of short side shoots, female solitary. Cone 2, roundish egg-shaped, woody, falling to pieces when ripe. China (Fig 47 B.)

PSEUDOTSUGA. Douglas Fir. Tall evergreen trees with pointed crowns. Bark grey or greenish, smooth on young trees, thick and furrowed later. Branches whorled, but not so regularly as in the spruces and silver firs Terminal buds long, narrow, and pointed. Ls. alternate, linear, 1, spirally arranged, imperfectly 2-ranked on older branchlets, round slightly raised scars left by fall of ls. Male fls. solitary in 1-axils, female terminal on short branchlets. Fruit a woody cone, 2×1 , hanging, scales with protruding 3-pronged bract.

P. Douglasii (*Abies Douglasii*) Oregon Douglas Fir. 250. Buds bright chestnut brown, beech-like, not resinous Ls. green on upper side. West North America. (Fig 47 A)

P. glauca. Colorado Douglas Fir. 150. Buds coated with resin Ls. covered with bluish grey bloom Colorado.

P. japonica. Japanese Douglas Fir. 100 Ls. notched at apex. Japan.

SCIADOPITYS VERTICILLATA. Umbrella Pine 100. Ls. linear, 4, grooved below, in whorls. Male fls. in terminal racemes, female solitary, terminal. Cone 3×2 , scales with recurved margins Japan. (Fig 47 C.)

SEQUOIA. Tall narrow evergreen trees with pointed crowns and uniform outline. Bark reddish, thick, soft and spongy. Ls. alternate, awl-shaped or linear, lower part adhering to stem Fruit a woody cone with diamond-shaped scales.

S. (Wellingtonia) gigantea. Mammoth Tree. 300. Ls. awl-shaped, $\frac{1}{2}$, pointed. Cone 3×2 California. (Fig. 47 E.)

S. sempervirens Redwood 300. Ls. linear, lanc, $\frac{3}{4}$, 2-ranked except on leading shoots where they are similar to those of preceding species. Cone $1 \times \frac{1}{2}$ California. (Fig. 47 D)

* TAIWANIA CRYPTOMERIOIDES. 150. E. Ls. in young trees alternate, awl-shaped, $\frac{1}{2}$, spine-tipped, keeled on both sides; in older trees scale-like, closely pressed to stem. Cone $\frac{1}{2}$, egg-shaped, terminal, with numerous rounded overlapping scales (Bean). Formosa. (Fig. 47 G.)

TAXODIUM DISTICHUM. Deciduous Cypress, Swamp Cypress. 100. D. Trunk buttressed at base. In wet places the roots send up hollow protuberances known as 'knee-roots.' Ls. alternate, linear, $\frac{1}{2}$, 2-ranked, the whole shoot falling off in

autumn; ls. spirally arranged on leading shoots. Male fls. in terminal drooping panicles; female scattered near end of previous year's wood. Fruit a leathery round or egg-shaped cone, $1\frac{1}{2}$, scales peltate. South United States (Fig. 47 M.)

* *TETRACLINIS ARTICULATA* Alcerce 50. E. Like *Cupressus* and *Thuya*, but cones have only four scales. North Africa. (Fig. 47 N.)

THUYA. *Arbor-vitae*. Foliage similar to *Cupressus* (q v.). Fruit a woody cone, usually elongated, with six to ten pairs non-peltate scales.

T. (Thuyopsis) dolabrata 50. E. Branchlets in opposite rows in horizontal plane. Ls. with brilliant and clearly defined white markings on back. Cone $\frac{3}{4}$, egg-shaped, each scale 3-5-seeded. Japan. (Fig. 47 O.)

T. japonica (Thuyopsis Standishii) 25. E. Bark twisted. Branchlet systems in horizontal planes. Ls. with white markings on back, but no glands, not aromatic; pairs on central axis not distant. Cone $\frac{1}{4}$, oblong. Japan. (Fig. 47 P.)

T. occidentalis. 60. E. Branchlet systems dark green above, pale green below, turning brown in winter, no white markings but glands prominent, central axis flattened, with l.-pairs close together. Cone $\frac{1}{4}$ to $\frac{1}{2}$. East North America (Fig. 47 R.)

Variety *aurea*. Young shoots yellow.

Variety *ericoides (Retinospora dubia)*. Ls. all juvenile; a dwarf shrub.

T. (Biota) orientalis. 40. E. Branchlet systems in vertical plane, same shade of green on both sides. Ls. very small, small depressed glands on lower surface, closely pressed to stem. Cone $\frac{3}{4}$, egg-shaped, scales hooked, seeds wingless. China (Fig. 47 Q.)

Variety *aurea*. Branches tipped with yellow in summer.

Variety *ericoides (Retinospora ericoides)*. Ls. all juvenile, glaucous.

T. plicata (T. gigantea, T. Lobbii) 200. E. Branchlet systems in horizontal plane. Ls. aromatic, with white markings and small glands on back; central axis not flattened, l.-pairs sharp-pointed and somewhat distant. Cone $\frac{1}{2}$. Alaska to North California. (Fig. 47 S.)

Variety *pyramidalis*. Tall and narrow form.

Varieties *variegata* and *zebrina*. Yellow interspersed with green.

TSUGA. Hemlock Spruce. Branches alternate. Ls. alternate, linear, flat, blunt, usually 2-ranked, with two white lines below. Male fls. solitary, round, in l.-axils; female at end of lateral shoots. Fruit a small woody drooping cone.

(a) *Ls. minutely toothed*

T. Albertiana (T. Mertensiana, T. heterophylla). Western Hemlock. 200. E. Leading shoot and branches drooping. Ls. $\frac{3}{4}$, the white lines with diffuse edges. Cone 1. West North America. (Fig. 47 H.)

T. Brunomana. Himalayan Hemlock. 120. E. Ls. 1, very white below, the lines with clearly defined edges. Cone 1. East Himalaya.

T. canadensis. Eastern Hemlock. 100. E. Ls. $\frac{1}{2}$, white lines with clearly defined edges. Cone $\frac{3}{4}$. East North America. (Fig. 47 J.)

T. Pattoniana (Abies Williamsonii). Mountain Hemlock. 100. E. Ls. not 2-ranked, 1, grey or bluish green. Cone $3 \times \frac{3}{4}$. West North America. (Fig. 47 K.)

TSUGA—continued

(b) *Ls. entire*

T. caroliniana. Carolina Hemlock. 50. E. Branchlets hairy on upper side. Ls. $\frac{1}{2}$. Cone $1\frac{1}{2}$. South-east United States.

T. Sieboldii. Japanese Hemlock. 100. E. Branchlets hairless. Ls. 1, notched at apex. Cone 1. Japan. (Fig. 47 L.)

* WIDDRINGTONIA WHYTEI. Milanji Cedar. 100. E. Main branches whorled. Ls. in young trees alternate, awl-shaped, 1; in older trees opposite, scale-like, closely pressed to stem. Cone woody, $1 \times \frac{1}{2}$, egg-shaped, 4-scaled, seeds winged. South Africa. (Fig. 47 F.)

Family 110. GINKGOACEAE

(One species only)

GINKGO BILOBA (SALISBURIA ADIANTIFOLIA). Maidenhair Tree. 100. D. Branchlets jointed. Ls. alternate or in clusters, fan-shaped, 3, notched or jagged, long-stalked. Male catkins 1, short-stalked; female fls. long-stalked. Fruit 1, egg-shaped, yellowish green, with a fleshy outer and a bony inner coat. China. (Fig. 27 B.)

CLASS IV. CRYPTOGRAMS

Flowerless and seedless plants, reproduction by spores.

Family III. *FILICES*

Spores minute, produced in conspicuous spore-cases on the l, usually on the under-side

* *DICKSONIA ANTARCTICA* Tree Fern 30. E Trunk covered with matted rootlets. Ls. 2-pinnate, 6 feet. by 2 feet, spreading palm-like from top of stem, crozier-like when opening. Australia and Tasmania. (Fig. 22 D.)

ADDITIONS AND CORRECTIONS

ADDITIONS AND CORRECTIONS

AFTER the foregoing pages had been printed space was found to be available for the following additional species. All can be grown successfully somewhere on the mainland of the British Isles or Western Europe. (The Scilly Isles, where apparently almost anything can be grown, are outside the region of this work)

No additions have been made to the genus *Rhododendron*, which, though highly ornamental and met with everywhere, would require a separate volume. Again, large genera, such as *Berberis*, *Crataegus*, *Prunus*, *Salix*, *Veronica*, and *Viburnum*, could be added to indefinitely; the result would, however, be of little interest to those who are not specialists in these genera. *Acer* and *Populus* have been dealt with more fully, as they are fast-growing and popular on that account.

With regard to synonyms, so many are in use that it has been found quite impossible to give more than a few. *The Hand-List of Trees and Shrubs cultivated in the Royal Botanic Gardens, Kew* (Fourth Edition, 5s. 6d.), and the companion, *Hand-List of Comferae* (Third Edition, 1s. 6d.), contain most of the synonyms, but nurserymen often use names which can be found in neither of these publications. The difficulties of nomenclature could be overcome in a comparatively short time if nurserymen and amateur cultivators would take the trouble to acquaint themselves with the international rules, and discard all illegitimate names.¹ As most of them have failed to do so, however, illegitimate names are often given precedence in this book, though not without reluctance.

The months of flowering cannot always be relied upon, particularly in species from the southern hemisphere, where the seasons are reversed. In mild seasons such species may flower at any time; and the flowering of native species is often abnormal for the same reason. Where no information under this head has been given the species has either not been known to flower in the British Isles or reliable information has not been forthcoming.

Any notifications of mistakes or important omissions will be gratefully received by the author, and will be incorporated with suitable acknowledgments in a revised edition if possible.

Page 143. CLEMATIS (a).

C. cirrhosa. 10. January–March. E. Ls. simple, ov., $1\frac{1}{2}$, coarsely toothed or lobed. Fls. $1\frac{1}{2}$, yellowish white, stalk with bracts. South Europe. Similar is *C. balearica* (*C. calycina*) with 3-fol. ls. and greenish yellow fls.

C. (Atragene) macropetala. Like *C. alpina*, but fls. up to 3 across, P₄, spreading. North Asia.

C. Rehderiana. 25. July. D. Ls. pinnate; lfts. ov., 3, coarsely toothed or lobed. Fls. $\frac{3}{4}$, yellow, nodding, fragrant, in axillary panicles. China.

CLEMATIS (b).

C. chrysocoma. 15. August–September. D. Fl.-stalks and ls. covered with yellow down. Ls. 3-fol. Fls. 2, white, tinged with pink. China.

¹ See *Nomenclature at the Sixth International Botanical Congress, Amsterdam, 1935* (*Gardeners' Chronicle*, 14th December 1935).

Page 143 CLEMATIS (b)—continued

C. Fargesii 15. July–September D Ls. 2-pinnate; lfts ov, 2, coarsely toothed or lobed Fls 2, white, in 3-flowered clusters China.

C. montana, variety *rosea* (*C. Spooneri*, variety *rosea*). Fls 3, pale rose-tinted

Page 144. CLEMATIS (c)

C. paniculata 30 September–October D Like *C. Flammula*, but much taller. Japan.

Page 145. For *chinensis* read *chinense*.

Page 149. For G_3 read $G_3-\infty$.

Page 150. BERBERIS (a).

B. Dielsiana. 10. May Ls. oblanc, 1, entire or with a few spiny teeth, glaucous below. Fls. in long racemes. Berry $\frac{1}{2}$, egg-shaped, scarlet. China

B. Francisci-Ferdinandu 10. May. Spines mostly simple Ls. ov, $2\frac{1}{2}$, spiny-toothed, green and glossy on both sides Fls. in long drooping racemes. Berry $\frac{1}{2}$, egg-shaped, scarlet. China.

Page 151. BERBERIS (b)

B. empetrifolia. $1\frac{1}{2}$. May. Ls. linear, $\frac{1}{2}$, spine-tipped, margins recurved. Fls. golden-yellow, solitary or in pairs. Berry black. Chile.

B. replicata. 4. March–May. Like *B. Gagnepainu*, but ls. smaller and margins recurved. Berry red, becoming black. China.

Page 152. MAHONIA.

M. pinnata. Like *M. Aquifolium*, but taller. California.

Page 154. For (*H. lasianthemum*) read (*H. lasianthum*).

Page 155.

POLIOTHYRSIS SINENSIS. At Abbotsbury there is a variety with wedge-shaped leaves that are thicker and coarser and 3-nerved at base.

Page 156. PITTOSPORUM (a).

P. Ralphu. Like *P. crassifolium*, but with larger and more oblong ls.

Page 157. HYPERICUM (a).

H. Kalmianum. 3. August–September. D. Stems 4-angled; branchlets 2-edged. Ls. lanc., 2, bluish green above, glaucous below. Fls. 1. East North America.

Page 158. HYPERICUM (b).

H. aureum. 3. August–September. D. Branchlets 2-edged. Ls. ov., 3, blue-green above, glaucous below. Fls. 2, terminal, sepals leaf-like. South United States.

* *H. empetrifolium*. 3. June–July. D. Like *H. Coris*, but sepals spreading in fruit. South Europe.

Page 165. ILEX (a).

I. crenata. 6. May–June. Ls. ov., 1, finely toothed, dark glossy green, hairless, crowded. Berry $\frac{1}{4}$, black. Japan.

Variety *variegata*. Ls. spotted yellow.

Page 166 EUONYMUS (a).

E. obovatus. Creeping Spindle Tree. 1. June. Trailing shrub with rooting stems. Ls. obov, 2, dull pale green. Fruit 3-lobed, crimson, warted. Canada and U.S.A.

E. verrucosus Warty Spindle Tree. 6. May. Branchlets densely warted. Ls. ov, 2. Fls. brownish. Fruit 4-lobed, yellowish red, seeds black and partly orange-coated. East Europe and West Asia

E. yedoensis. 20. June. Ls. obov., 5. Fruit deeply 4-lobed, crimson, seeds orange-coated. China.

Page 167 EUONYMUS (b).

E. echinatus. Like *E. radicans*, but fruit prickly Himalaya.

E. tingens 20. June. Ls. ov., lanc, 3, leathery, dark green and wrinkled above. Fruit 3-5-angled, seeds orange-coated Himalaya

Page 169. For *imeritina* read *imeretina*.

Page 171. AESCULUS (b).

A. glabra. Ohio Buckeye. 30. May-June D. Lfts obov, 5, finely toothed. Fls. greenish yellow. Fruit prickly. U.S.A.

A. neglecta 75. May-June. D. Like *A. octandra*, but fls. red or tinged with red. North Carolina.

Page 172. ACER. A few species have unlobed ls. Among them are.

A. carpinifolium. Hornbeam Maple 30. May. D. Ls. ov., oblong, 4, long-pointed, double-toothed. Wings of fruit wide-angled. Japan.

A. Davidii. 40. May. D. Branchlets green, striped with white lines. Ls. ov., 6, dark green, unevenly toothed. Fls. yellow, in drooping racemes. Wings of fruit horizontal. China.

A. oblongum. 30. April-May. $\frac{1}{2}$ E. Ls. oblong, 5, entire except on young trees, leathery, 3-nerved, white below. Wings of fruit spreading at wide angle. Himalaya. *A. laevigatum* is similar, but ls. green below and with shorter stalks. Himalaya.

A. tataricum. Tatarian Maple. 25. May. D Ls. ov., 4, unevenly toothed. Wings of fruit nearly parallel. East Europe and West Asia.

Page 172. ACER (a).

A. capillipes. 30. June. D. Like *A. pennsylvanicum*, but ls. without reddish hairs when young. Japan.

A. glabrum. Rock Maple. 25. April D. Ls. 5, dark glossy green above, pale or glaucous below, stalks thin and red. Wings of fruit nearly parallel. West North America.

A. spicatum. Mountain Maple. 25. June. D. Ls. 5, coarsely and unevenly toothed, yellowish green above, downy below. Wings of fruit at acute angle. U.S.A.

ACER (b).

A. argutum. 25. April. D. Ls. 3, lobes long-pointed, sharply toothed, pale green. Wings of fruit horizontal. Japan.

A. barbinerve. Like *A. argutum* (above), but ls. coarsely double-toothed. Wings of fruit not horizontal. Japan.

Page 172. ACER (*b*)—*continued*

- A. caesium*. 100. April–May. D. Ls 8, coarsely blunt-toothed, pale and glaucous below, bright red when young. Wings of fruit at acute angle. Himalaya.
- A. caudatum*. 80. March–April. D. Ls. 5, lobes long-pointed, sharply toothed, the two outer ones smaller or absent. Wings of fruit at acute angle. Himalaya.
- A. diabolcum*. Horned Maple. 30. April D. Ls. 6, coarsely toothed, downy when young. Wings of fruit nearly parallel, nuts bristly. Japan.
Variety *purpurascens*. Ls. red when young. Fls. purplish
- A. laetum*. Wings of fruit spreading at wide angle
- A. Lobelii*. 60. May. D Like *A. platanoides*, but ls. smaller (4), and lobes nearly entire. South Italy.
- A. Miyabei* 40 May D Branchlets corky. Ls. 6, deeply heart-shaped base, coarsely blunt-toothed, downy below Wings of fruit horizontal, nuts velvety. Japan.
- A. Opalus* Italian Maple. 30. March D Ls 4, lobes roundish, undulating, dark green above, slightly downy or glaucous below. Wings of fruit at acute angle. Italy.
- A. pictum* 80 April D. Like *A. laetum*, but young branchlets yellowish grey the second year. Himalaya to Japan.

Page 173. ACER (*c*).

- A. cissifolium*. 30 April–May. D Ls. 3-fol ; lfts ov., 3, stalked, coarsely and unevenly toothed, pale green below. Wings of fruit at acute angle. Japan.
- A. glabrum*. See under (*a*) above.
- A. Henryi*. 30. April D. Ls. 3-fol., lfts. ov., 4, stalked, with a few large blunt teeth, green below. Wings of fruit nearly parallel. China.
- A. nikoense*. Nikko Maple. 40. May. D. Ls 3-fol ; lfts. ov., 4½, distantly toothed. Wings of fruit curved inwards. Japan.

Page 177. CYTISUS (*b*).

- C. Porlock*. Porlock Broom 6. May–June. E. Stems leafy, erect, angled, downy. Lfts. obov., $\frac{3}{4}$, hairy on midrib below. Fls. $\frac{1}{2}$, yellow, fragrant, short-stalked, borne profusely towards end of side shoots. Hybrid offered by Messrs. Scott & Co, Merriott, and said to be hardy and fast-growing.

Page 178. For *purpurea* read *purpureus*.

Page 179. ULEX.

The Dwarf Furze, *U. minor*, scarcely exceeds 1 ft. in height, and is distinguished by the smooth or nearly smooth calyx. Western Europe (including Britain).

Page 180. For *Chamlagii* read *Chamlagu*.

Page 186. SPIRAEA (*a*).

- S. bracteata* (*S. nipponica*). 6. June. D. Branches angled. Ls. obov., 1, toothed near apex, dark green above, blue-green below. Fls. white, in many-flowered clusters. Japan.

Page 194. For *phoenicolasus* read *phoenicolasius*.

Page 197 PRUNUS (11)

P. blireana 30 March D Branches slender, hairless. Ls. rolled in bud, ov., 3, round-toothed, coppery purple. Fls 1, pink, double, solitary or in two or threes Hybrid.

Page 204. For *Tschnoski* read *Tschonosku*

Page 206. SORBUS (b).

S. Vilmorini. 15 May. D Branchlets and buds with rusty down. Lfts numerous, oblong, 1, toothed in outer half. Fruit $\frac{1}{2}$, pale rosy red. China.

Page 207. DEUTZIA (a)

D. magnifica 10 June. D Ls ov, 6, sharply toothed, rough above Fls. white, double, in panicles up to $2\frac{1}{2}$. Hybrid.

D. Wilsoni Like *D. discolor*, but ls broader and hairy below. China.

DEUTZIA (b).

D. kalmiaeflora. 3 May-June. D. Ls ov, lanc, 2, finely toothed Fls. $\frac{3}{4}$, white, flushed carmine, in rather loose branched clusters Hybrid.

D. purpurascens 6. June D. Ls ov., lanc., $1\frac{1}{2}$, unevenly toothed, rough above. Fls $\frac{3}{4}$, purplish outside, in branched clusters. China.

Page 209. HYDRANGEA (b)

H. aspera. 8. July D Branchlets covered with stiff straight hairs. Ls. oblong, lanc., 8, coarsely toothed, white below, densely hairy. Outer fls. pink, inner blue. Himalaya.

H. heteromalla (*H. vestita*) 8. June-July. D Young branchlets covered with thick down. Ls. ov., 8, coarsely toothed, dark green above, white below, stalk red. Fls. white Himalaya.

H. strigosa. 8. July D. Like *H. aspera*, but ls. finely toothed, and grey below. Outer fls. white or pale purple. China.

Page 210. PHILADELPHUS (a).

P. incanus. 10. July-August D. Ls. ov., 3, grey and downy below. Fls. 1, white, scentless, in 5-7-flowered racemes, calyx downy China

P. pekinensis. 6. June. D. Branchlets hairless, bright brown or purplish. Ls. ov., $2\frac{1}{2}$, wedge-shaped base, 3-nerved, hairless, stalks purplish Fls. 1, creamy white, in 5-7-flowered racemes North China.

P. purpurascens. 12. June. D. Like *P. Delavayi*, but young shoots downy and ls smaller. Fls very fragrant China.

P. subcanus. 10. June. D. Like *P. incanus* (above), but style hairy at base, and ls. with coarse stiff hairs below. China.

Page 213. *Liquidambar formosana*. 80. Ls. usually 3-lobed. China and Formosa.

Page 215. For *Nichollu* read *Nichollsii*.

Page 216. *Fuchsia Riccartonii*, the common hardy fuchsia, is probably a variety of *F. macrostemma*. According to Rehder it is distinguished by the purplish tinge of the oblong-ov. ls. and the short calyx tube, with shorter and broader lobes.

Page 217 ACANTHOPANAX (*b*).

A. spinosum (*A. pentaphyllum*). 10. June D. Ls. 5-fol ; lfts obov., $1\frac{1}{2}$, thin, with a few hairs. Fls. greenish white, styles 2. Japan.

Variety *variegatum*. Ls. edged with white

Page 218.

HEDERA HELIX Variety *hibernica*. Irish Ivy Ls up to 6, thinner and of lighter colour Variety *japonica*, ls. on sterile shoots 3-lobed, 2

CORNUS. The following two species have alternate ls.

C. alternifolia 25. June. D Branches irregularly whorled, green, hairless Ls ov., 4, slender-stalked, 5-6 pairs veins, crowded at end of branch. Fls. white, without bracts Berry blue-black, bloomy. North America.

C. controversa. 60. June-July D. Like above, but ls have 6-9 pairs veins Himalaya to Japan.

Page 220.

The position of *Garrya elliptica* in the family *Cornaceae* cannot be justified. It is much more akin to the catkin-bearing families on pages 271 to 281.

Page 226. For *bitchuense* read *bitchuense*

Page 231. For ANTENNARIA read ANTENNARIA

Page 234. For *Vaccinium macrocarpus* read *macrocarpum*.

Page 235. For *Idaea* read *idaea*

Page 237.

Clethra Fargesii. 12 July-August. D. Ls. ov , 5, nearly hairless, 10-15 pairs veins. Fls in several terminal spikes. China.

Page 238. GAULTHERIA.

G. Miqueliana (*G. pyroloides*). 1. May-June E. Ls. ov., 1, toothed, crowded at end of shoot. Fls. in racemes. Berry $\frac{1}{2}$, white or pinkish. Japan

G. trichophylla. $\frac{1}{2}$ June E. Aromatic Ls ov., oblong, $\frac{1}{2}$, glossy, hairless except on margins, crowded Fls pink, bell-shaped, solitary. Berry $\frac{1}{2}$, blue. Himalaya.

G. Veitchiana. 3. May-June. E Branchlets hairy Ls. ov., oblong, 3, minutely toothed, dark green and wrinkled above, hairy on veins below. Fls. white, in racemes. Berry $\frac{1}{2}$, dark blue China.

Page 260. For LEONOTUS read LEONOTIS.

Page 278. POPULUS (*b*).

P. berolinensis. 100 March. D. Like Lombardy poplar, but ls. whitish below and stalk not flattened. Hybrid between Lombardy poplar and *P. laurifolia*.

P. Fremontii (*P. Wislizenii*). 100. March. D. Like *P. nigra*, but ls. without hairs on margins. California.

P. marilandica. 100. March. D. Like *P. serotina*, but branchlets cylindrical and leafing earlier. Hybrid.

P. regenerata. 100. D. Like *P. serotina*, but leafing earlier. Hybrid.

P. robusta. 150. D. Branchlets stout, angled; buds brown and sticky. Ls. ov , 7, round-toothed, stalk flattened. A very fast-growing tree. Hybrid.

Page 278 *POPULUS* (c).

P. grandidentata. Large-toothed Aspen 75 February. D. Branchlets stout, covered with grey down when young; buds grey, hairy. Ls ov, 4, with coarse undulating teeth, dark green above, grey below when young. East North America.

Page 279 *POPULUS* (d).

P. laurifolia. 50. March D. Like *P. trichocarpa*, but ls lanc and branchlets yellowish grey. Siberia.

P. yunnanensis 100 D. Like *P. trichocarpa*, but ls usually broadest above middle China.

SALIX (a)

S. Bockii 10 October. D Young twigs covered with grey down Ls. obov., $\frac{1}{2}$, deep green above, blue-white below, entire or slightly toothed Stamens two. China

S. Caprea, variety *pendula*. Kilmarnock Weeping Willow.

Page 280. *SALIX* (b).

S. Meyeriana. 50. March-April D. Branchlets wine-coloured. Ls ov, oblong, 4, finely toothed, glossy green above, pale bluish green and somewhat glaucous below. Catkins pinkish, stamens four. Natural hybrid

Page 281. *SALIX* (c).

S. magnifica. 20. D Ls. broadly ov., 6, entire or nearly so, dull bluish-green above, resembling magnolia. China.

Empetraceae is out of place next to *Salicaceae*, with which it has little in common. The affinities of the family are obscure, but it appears to be allied to *Euphorbiaceae*.

Page 293. *CUPRESSUS* (b).

C. Goveniana. 20. E. Like *C. macrocarpa*, but much smaller. Foliage orange-scented when bruised. Male fls. and cones produced in great abundance, the ground beneath becoming yellow with pollen. South California.

Page 298. *PINUS* (c).

P. Ayacahuite. Mexican White Pine. 100. E. Like *P. excelsa*, but cones much longer (up to 18). Mexico.

P. Montezumae. Rough-barked Mexican Pine. 100. E. Bark thick and rough Ls. 6, erect, glaucous green, sheath 1, persistent. Cone $6 \times 2\frac{1}{2}$, scale with short hooked prickle. Mexico.

Page 300. *Thuja dolabrata*, variety *variegata*. Ls. variegated with creamy white.

Tsuga Pattoniana should come under (b). The species is distinguished by the radial arrangement of the ls., which are rounded or keeled above, and with white on both sides.

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